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March 11, 2005

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APPLICATION NUMBER: *60/546,165*

FILING DATE: *February 23, 2004*

By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

M. K. Hawkins

M. K. HAWKINS
Certifying Officer

PTO/SB/16 (10-01)
Approved for use through 10/31/2002. OMB 0651-0032
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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No.

INVENTOR(S)

Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
Hans	van der Laan	Veldhoven, The Netherlands

☐ *Additional inventors are being named on the ______ separately numbered sheets attached hereto*

TITLE OF THE INVENTION (500 characters max)

System, Method, and Apparatus to Separate Dose and Focus Based on Scatterometry Data

Direct all correspondence to: **CORRESPONDENCE ADDRESS**

☒ Customer Number 00909 → *Place Customer Number Bar Code Label here*

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Country		Telephone		Fax	

ENCLOSED APPLICATION PARTS (check all that apply)

☒ Specification *Number of Pages* 45 ☐ CD(s), Number

☒ Drawing(s) *Number of Sheets* 0* ☐ Other (specify)

☒ Application Data Sheet. See 37 CFR 1.76

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT

☐ Applicant claims small entity status. See 37 CFR 1.27.

☐ A check or money order is enclosed to cover the filing fees

☒ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: 033975

☐ Payment by credit card. Form PTO-2038 is attached.

FILING FEE AMOUNT ($): 160.00

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: ______________________

Respectfully submitted,

SIGNATURE [signature]

Date Feb 23, 2004

TYPED or PRINTED NAME Kerry Hartman

REGISTRATION NO. *(if appropriate)* 41818

Docket Number: 081468-0308434

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USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

*Color figures integrated with text.

Attorney Docket No. 081468-0308434 *PATENT*
Client Reference: P-1823.000-US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Hans van der Laan

Application No.: NEW Confirmation No:
Filed: February 23, 2004 Group No.:
Examiner

For: System, Method, and Apparatus to Separate Dose and Focus Based on Scatterometry Data

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPLICATION DATA SHEET
37 C.F.R. § 1.76

BIBLIOGRAPHIC DATA

1. Applicant information

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3. Application information

Title of Invention: System, Method, and Apparatus to Separate Dose and Focus Based on Scatterometry Data

Docket number assigned to this application: 081468-0308434
Suggested Classification: Class:
Subclass:
Technology Center to which subject matter is assigned:

Total number of drawing sheets: 0 (color figures integrated with text)
Type of application: Provisional

Secrecy order under § 5.2: This application does not disclose subject matter of an application which is under a secrecy order pursuant to § 5.2.

4. **Representative information**

The following have a power of attorney or authorization of agent in this application:

Customer No.: 00909

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Extent of interest of assignee in application: Entire right, title and interest.

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Provisional U.S. Patent Application: SYSTEM, METHOD, AND APPARATUS TO SEPARATE DOSE AND FOCUS BASED ON SCATTEROMETRY DATA

ASML

Summary

A scatterometry method is described which can separate focus and dose errors made during exposure. The focus data is correlated to other techniques. A method according to one embodiment of the invention, based on Principal Component Regression, comprises two steps:
1. A calibration FEM is exposed, readout by the scatterometer, and the measurement results are used to build a model of focus/dose vs. spectra. This model is directly based on the scatterometry spectra. Potential advantages may include that no knowledge of optical properties of materials is required and that complex and time consuming building of libraries can be skipped.
2. The to-be-measured-wafers are read-out. Using the model, the recorded spectra are translated into focus and dose values. The calculation only takes a few seconds per wafer (1000 points).

The scatterometer can measure gratings in the scribe lane or directly structures in the chip, making the technique suitable for on-product monitoring and calibration. The accuracy (including repro) is better than 25nm (3σ) per single field point, which is comparable to that of FOCAL. Correlating scatterometry results with LVT (PreFoc) and Wafer map MA data concludes this. As an example, with this accuracy, Ry determination is better than 0.2µrad (3σ) when using 75 measurement points.

Introduction

There are many techniques for focus calibration using test wafers: FOCAL, LQT (reticle with small prisms), phase shift focus monitor,..... They require a special mask, a special illumination setting or a focus meander for each measurement, disqualifying them for measurements on product wafers.

For focus measurements on product wafers, either on marks in the scribe lane or directly within the chip, only few techniques exist which are not very mature. A currently used technique is the measurement of Line-End-Shortening of test targets in the scribe lane, e.g. KLA MPX. This technique, however, does not contain information on the sign of focus and is therefore only suited for monitoring and not for correcting focus.

This memo shows how scatterometry can be used to measure focus. Two strong points for scatterometry are:

- There are no special requirements on mask type and/or illumination mode, i.e. it is directly suited for measurement of product wafers.
- The raw output of the scatterometer HW is one or more fine-structured spectra, the shape of which varies strongly with the line width and shape of the measured feature. This implies that the information content of scatterometry spectra is enormous. The expectation is that also focus information is present; the challenge is how to retrieve it.

The presented scatterometry technique is based on direct evaluation of spectra, by comparing them to spectra measured on a calibration FEM. This technique may reduce or eliminate standard scatterometry drawbacks like the need for forehand knowledge of optical properties of materials and the complex and time-consuming building of libraries. Furthermore, the technique is not limited to the standard 1D-structures, but also allows measurement of 2D-structures and even directly on product.

Further embodiments include taking into account dependencies on resist type and/or scatterometer type (polarized reflectometer, un-polarized reflectometer, or ellipsometer).

In principle, all focus applications are possible:

- Focus calibration using test wafer
- Focus monitoring on product wafers (both scribe-lane and within chip)
- Focus calibration on product wafers (both scribe-lane and within chip)

A method according to an embodiment of the invention

The method includes a calibration step followed by measurement of product wafers. In the calibration step a FEM is exposed and the corresponding scatterometry spectra are measured. The second step is recording the scatterometry spectra for the product wafers. It may be desirable or necessary that both calibration and product measurements are performed for the identical structure and process conditions.

APPLICATION UNDER UNITED STATES PATENT LAWS

.tty. Dkt. No. 308434

nvention: System, Method, and Apparatus to Separate Dose and Focus Based on Scatterometry Data

nventor (s): Hans van der Laan

Address communications to the correspondence address associated with our Customer No

00909

Pillsbury Winthrop LLP

This is a:

☒ Provisional Application

☐ Regular Utility Application

☐ Continuing Application

☐ The contents of the parent are incorporated by reference

☐ PCT National Phase Application

☐ Design Application

☐ Reissue Application

☐ Plant Application

☐ Substitute Specification
Sub. Spec Filed ____________
in App. No. ______/______

☐ Marked up Specification re
Sub. Spec. filed ____________
In App. No ______/______

SPECIFICATION

30435923_1.DOC PAT-100CN 8/03

The principle of this calibration is explained by Figure 1. It displays spectra belonging to the calibration FEM (left) and a spectrum originating from the product wafer (right). Most straightforward way-of-working would be searching for the best match between a product wafer spectrum and one of the spectra in the FEM-set. From the best match, the focus and dose values can be derived.

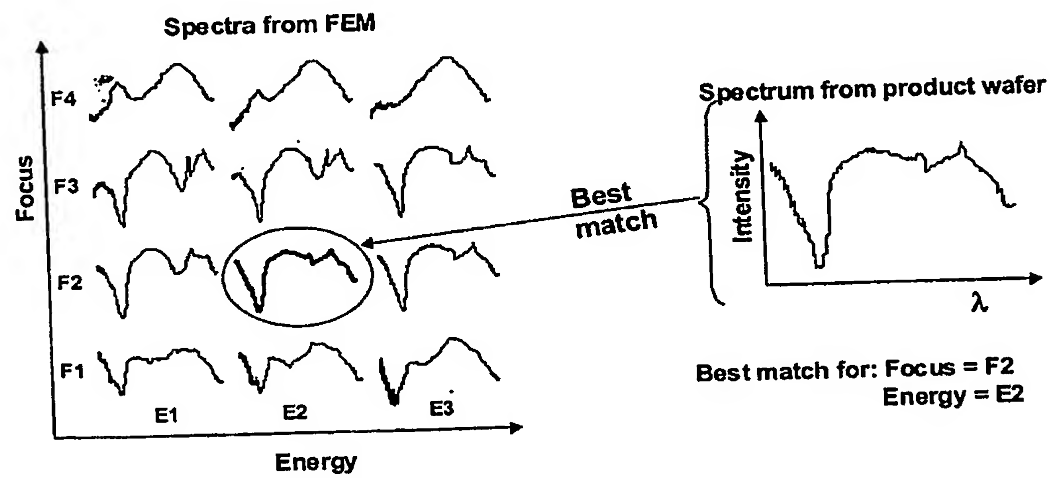


Figure 1 *Spectra belonging to calibration FEM (left) and a spectrum originating from the product wafer (right). Finding the best match between spectra gives the focus and dose values.*

For our analysis, however, we used a more sophisticated algorithm: Principal Component Regression (PCR). The principle is that each spectrum can be described by a sum of basic spectra or principal components (similar to Fourier analysis where each signal can be split up in its Fourier components). There are two advantages with respect to the straightforward method: 1. Smoothing of the noise in the calibration step (by limiting the number of principle components) and 2. Avoiding the discretization of the determined focus and dose values by using a regression technique (i.e. fit).

Experimental

Experiments were performed within the project "Correlation (de)focus vs. CDU".

Scanner + Illum	AT:850, M8868, NA=0.8, σ=0.85/0.55
Wafers	Full wafer exposures on four special MEMC wafers (A,B,C,D), deliberately made unflat. In this memo, only data from wafers C and D have been analysed
FEM Exposure	21x21 FEM: focus range –300 → 300nm, step 30nm dose range 22 → 32 mJ/cm^2, step 0.5 mJ/cm^2 To avoid processing influences, a mini FEM was exposed. Position on wafer: x = 60 → 90mm, y = -25 → 25mm A section of 13x9 is used in the calibration step focus: -300 → 60nm, dose: 26 → 32 mJ/cm^2
Wafer map, MA	Measurements in same run as the LVT exposures Focus offset of –90nm to match scatterometry measurements
LVT Full wafer exposure	LVT exposures on the four MEMC wafers. After read-out, wafers were stripped and re-coated for the CDU exposures. Focus offset of –125nm to match scatterometry measurements
CDU Full wafer Exposure	Exposed with Focus offset: -110nm Dose: 27.4mJ/cm^2 Standard CDU layout, field size 26x33mm CDU exposures on same chuck as LVT exposures Exposures on the four MEMC-wafers
Process	DUV42 (60nm) + PEK500 (330nm) + Aquatar6 (52nm), i.e. standard AT850 qualification process
Reticle	ELM-SCAT-110, 455.6311.1i001
Measurement grid	MA, 7 x 61, X = ±10.2mm, Y = ±15.2mm LVT, 9 x 7, X = ±12.7mm, Y = ±16.2mm Scat, 7 x 5, X = ±12.4mm, Y = ±15.4mm
Structure	110nm isolated line (pitch 1;6, binary mask)
Scatterometer	KLA-Tencor SpectraCD. Oblique incidence

Figure 2 is a wafer map of the MEMC-C wafer measured by the Level Sensor. A number of 'holes', with a depth up to 0.5µm, is visible. The area within the rectangle has been measured by scatterometry. The flatness of the other 3 wafers is similar but with the 'holes' at different locations.

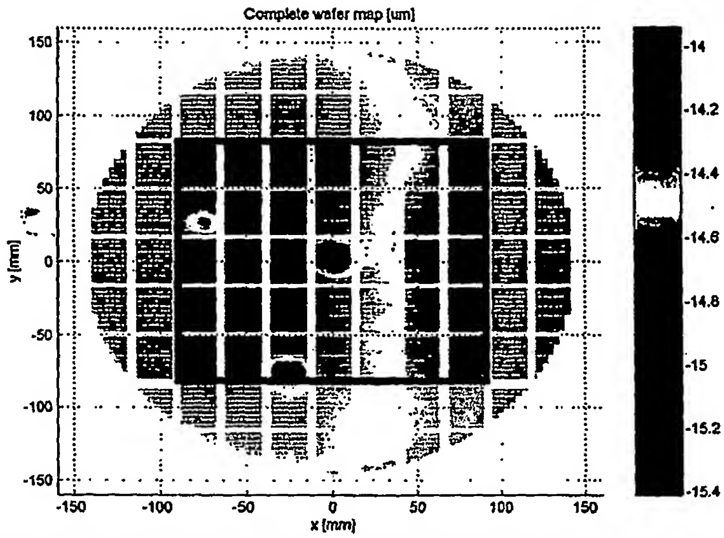


Figure 2 *Wafer map for MEMC_C. The area within the box has been measured by scatterometry.*

Results

As described in the section 'method', the spectra coming from the FEM wafer may be used to build the model. In this example, not all 21x21 spectra are used, but a subset containing 13 focus steps and 9 dose steps. Also in this example, the focus range chosen to be symmetrical around Best Focus, and the dose range is chosen to cover the expected dose variation.

One set of measures for the quality of the created model are the residue in focus and dose between the values set by the FEM and those given by the model. The residue for focus is 7nm (3σ) and for dose 0.15% (3σ).

Applying this model to the spectra from MEMC-C wafer results in the focus and dose distribution shown in Figure 3. The white spaces indicate missing data points[1]. The focus errors over a large part of the wafer are small. Near the 'holes', second order focus errors across the field are seen, which the leveling system may not be able to correct.

The fields without 'holes' can be used to determine the intra-field fingerprint. The intra-field focus fingerprint should correlate with the focal plane, e.g. measured by FOCAL. For dose, the intra-field variation should correlate to the sum of dose uniformity and reticle fingerprint (in a later stage we will look at these intra-field correlations).
Furthermore, note that the inter-field dose fingerprint clearly shows across wafer gradient with dose increasing towards (+X,-Y).

[1] In these case the model could not determine the focus and dose values belonging to the spectrum, since the values were outside the calibration range

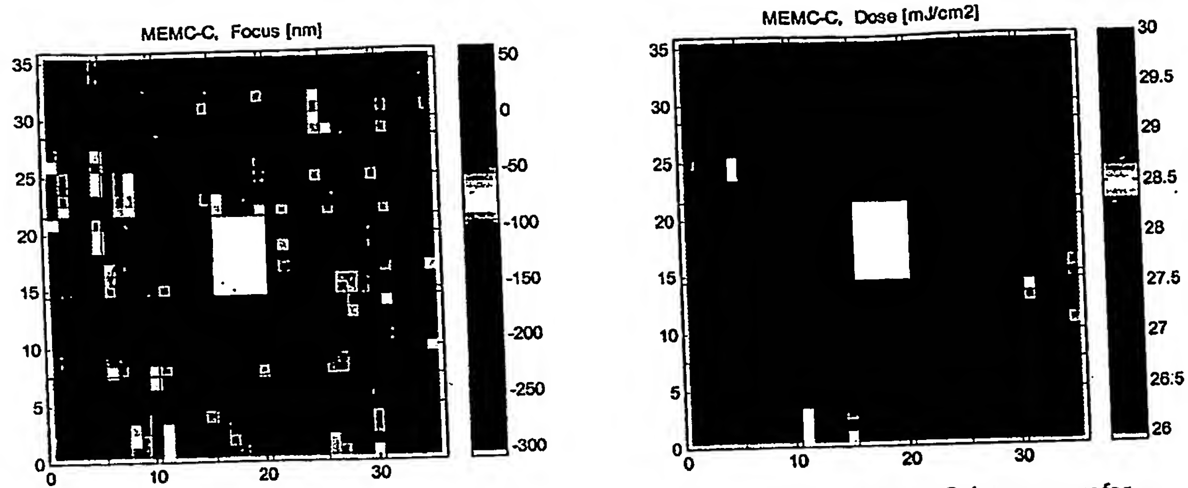


Figure 3 *Full wafer Focus and Dose measurements by scatterometry on MEMC_C (area on wafer given by rectangle in Figure 2). The center field has been exposed differently and was therefore not read-out. The white squares indicate missing data points.*

To verify the accuracy of the scatterometry results, correlation to other well-established methods was considered. For focus this will be discussed below, while for dose no reference technique was available and will be neglected in the remainder of this memo. Figure 4 shows focus errors, determined from the Wafer Map moving average values, MA (left) and scatterometry (right). The scatterometry data has been interpolated to the MA measurement grid for sake of comparison. A good correlation is seen.

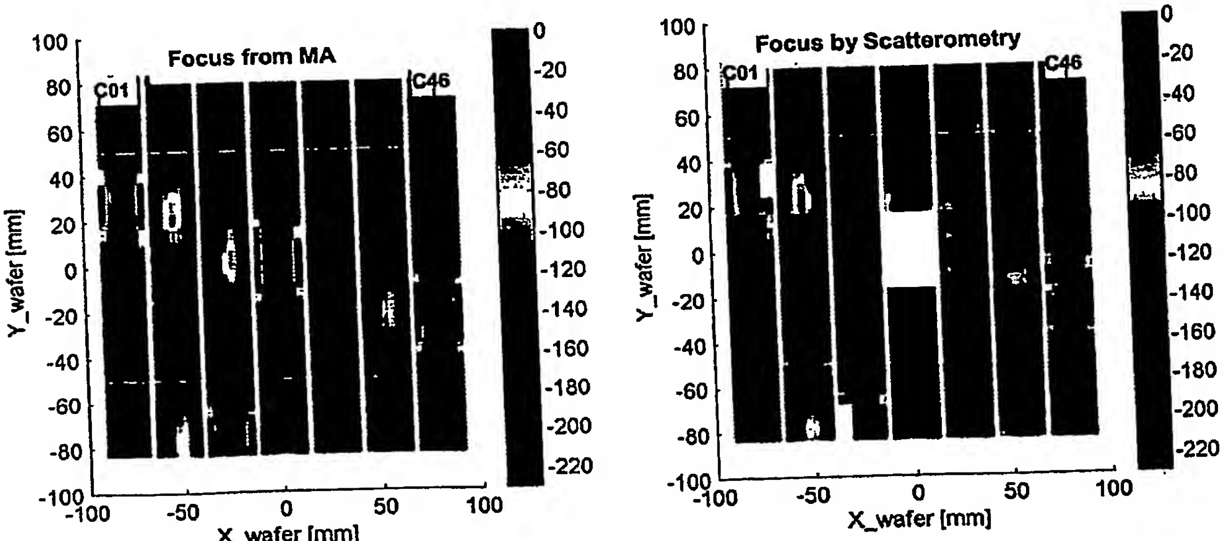


Figure 4 *Focus measurements by MA (left) and scatterometry (right) on MEMC_C. The scatterometry data has been interpolated to the MA measurement grid.*

Figure 5 compares two columns of the focus data obtained by MA and scatterometry as indicated in Figure 4. On the left, a typical example with a 3σ focus difference of 33nm. On the right, a better than typical example with a 3σ focus difference of 19nm. For both cases the correlation is very good, $R^2 \geq 0.90$. The figure also shows that there is a systematic intra-field difference between both techniques. The MA-values are always higher than the scatterometry values at the edge of the field. A difference can be expected since the lens and reticle contribution to focus may be present only in the scatterometry data.

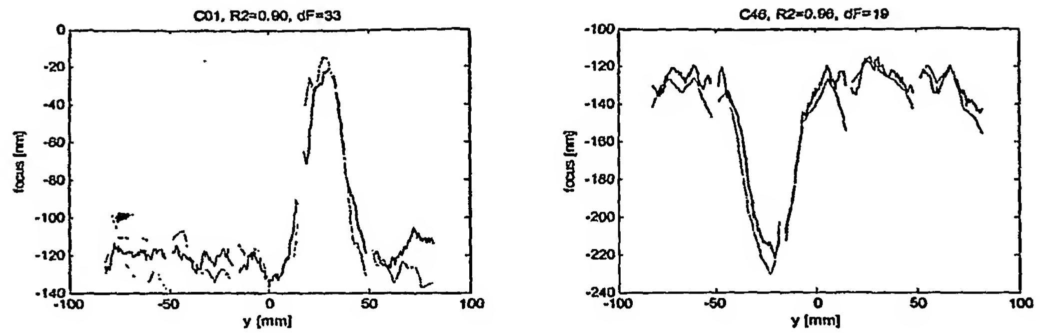


Figure 5 *Focus measurements by MA (black trace) and scatterometry (red trace) for two columns of Figure 4, (MEMC_C). On the left, a typical example with a 3σ focus difference of 33nm (column 1). On the right, a good example with a 3σ focus difference of 19nm. For both cases the correlation is very good, $R^2 \geq 0.90$.*

In Figure 6 the scatterometry data is compared to the next technique called Leveling Verification Test (LVT, on the PAS LQT). This test uses a distortion like reticle with a large number of small prisms, each glued above an alignment mark. The principle is that focus errors are translated into overlay errors. The LVT-data has been interpolated to the scatterometry measurement grid. Also here a good correlation is seen.

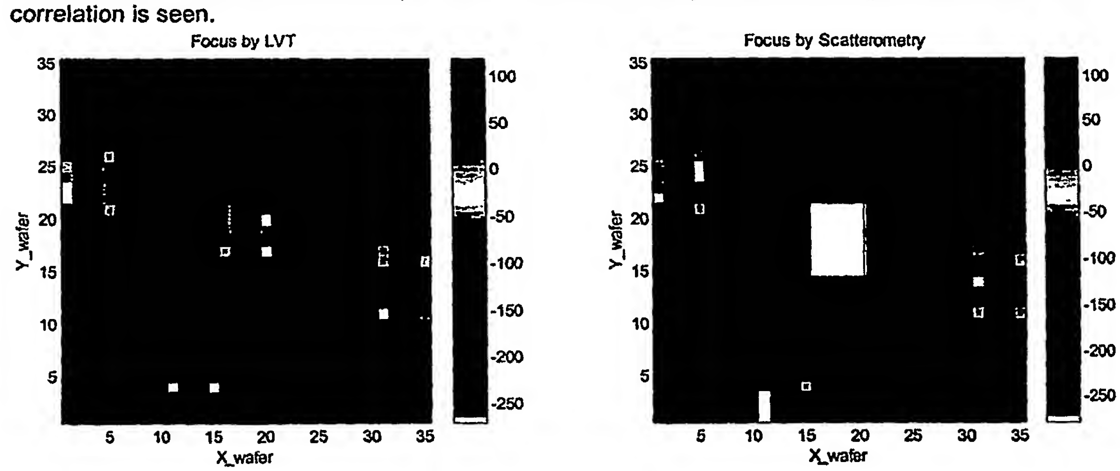


Figure 6 *Focus measurements by LVT (left) and scatterometry (right) on MEMC_C. The LVT data has been interpolated to the scatterometry measurement grid.*

Figure 7 shows the correlation plots of scatterometry with LVT and scatterometry with MA. The intra-field differences between both techniques have been removed, since they are different for each technique. The plots show a slope slightly below 1 (scatterometry measures a slightly larger focus variation) and a good correlation, $R^2>0.8$.

For the large positive values in the LVT graph, larger deviations are found. Possibly these points are so far out-of-focus (BF is at –110nm) that the process is not very reproducible for 110nm isolated line imaging.

Note that the focus range for the Scatterometry – LVT correlation plot is larger than that for Scatterometry – MA. The reason is that the maximum X-field position is 10.2mm for MA compared to 12.4mm for Scatterometry, and the largest focus errors are found at the field edge.

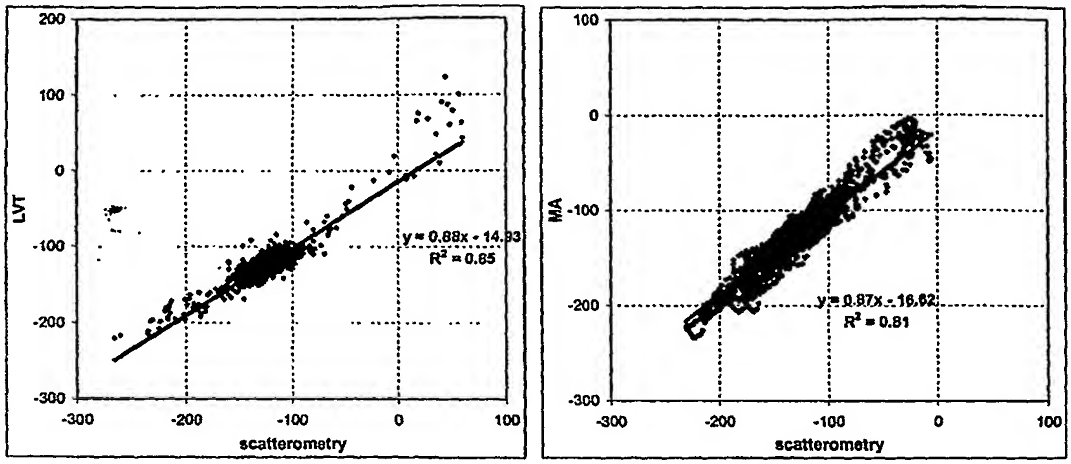


Figure 7 *Correlation plot displaying the correlation Scatterometry-LVT and Scatterometry-MA for MEMC_C.*

Table 1 summarizes the correlation results. It gives the differences in focus measured by LVT and scatterometry for two wafers and two types of scatterometry spectra (α/β)[2]. The correlation results are very similar for both wafers and do not depend strongly on the type of spectrum used. The correlation, expressed in 3σ-focus difference, seems to be better for MA. One should realize, however, that the focus range for the Scat/LVT correlation is larger than for MA (caused by the difference in measurement grid)

The upper limit for the scatterometry accuracy is given by the focus difference between the two best matching techniques (Scat. and MA). The real accuracy will be better since MA also has a certain inaccuracy and the wafer has been recoated in between the two measurements. The conclusion is that the accuracy (incl. repro) is better than 25nm (3σ)

	MA			LVT		
	dF [nm 3σ]	slope	R^2	dF [nm 3σ]	slope	R^2
MEMC_C, α	26	0.87	0.81	36	0.88	0.85
β	25	0.93	0.77	36	0.87	0.76
MEMC_D, α	31	0.81	0.71	37	0.81	0.81
β	27	0.90	0.73	36	0.81	0.74
Average	**27**	**0.88**	**0.75**	**36**	**0.85**	**0.79**

Table 1 *Focus differences between Scatterometry - MA (left) and Scatterometry - LVT (right). Correlation is presented as the 3σ-focus deviation between both techniques, and the regression slope and correlation coefficient R^2.*

A clue on the repro is given by Table 2. It shows the difference in focus is determined with either one of the spectra types. These values can be considered as a lower value for the repro. In the future, comparisons of focus measured with H and V will be done.

	Focus difference between α- and β-spectra [nm]	
	3σ	mean

[2] The KLA scatterometer is based on a ellipsometer, which simultaneously measures two polarization directions, resulting in two spectra, called α and β. All results up to now, however, have been only based on the α-specra.

MEMC_C	14	4.1
MEMC_D	12	5.4

Table 2 *Differences in focus determined with either one of the two scatterometry spectrum types (α or β). This intrinsic comparison shows a very good match.*

Use of the Scatterometry Focus Technique

Figure 8 (left) shows the residuals from the LVT/Scat correlation for MEMC_C of Figure 7. On the right, a similar plot for MEMC_D. A patch like structure is seen, indicating that not all fields are exposed with exactly the same focus value. Differences up to 20nm are seen.

Another example is the determination of image tilt Ry. With a single point accuracy of 25nm (3σ), Ry determination is better than 0.2μrad (3σ) when using 75 measurement points.

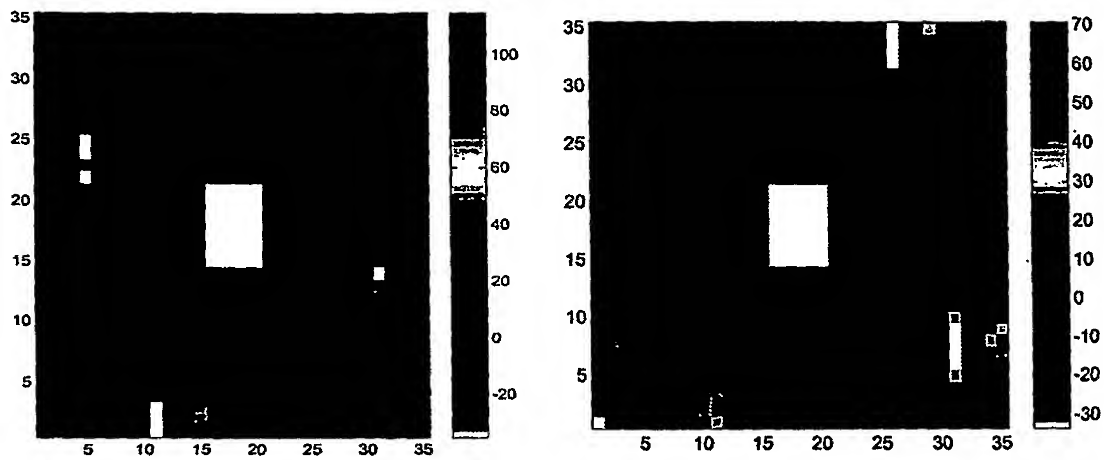


Figure 8 *(Left) Residuals from the left part of Figure 7 plotted as function of wafer coordinates, data from MEMC_C. On the right, a similar plot for MEMC_D. The plot clearly shows that the focus differences between the LVT and scatterometry exposure varies from field to field.*

Attachments

(1) "Title of the Development," 2 pages with integrated color figures.

(2) "Focus measurements with scatterometry," 22 pages with integrated color figures.

(3) Spreadsheet referenced on page 8 of attachment (2), 10 pages.

Claims

1. Method of determining parameters related to a lithographic apparatus comprising:

- using a scatterometer to measure calibration spectra on a calibration focus-energy matrix (FEM);
- using a scatterometer to measure a spectrum of at least one diffractive structure of a substrate; and
- analyzing the measured spectrum of the at least one diffractive structure;

wherein said analyzing of the measured spectrum includes comparing the calibration spectra and the measured spectrum of the at least one diffractive structure.

2. The method according to claim 1, wherein said analyzing includes deriving parameters to be determined by employing a regression technique.

3. The method according to any of claims 1 and 2, wherein said analyzing includes applying a mathematical model which compares the calibration spectra on the calibration FEM with the measured spectrum on said substrate and derives the parameters to be determined by employing a regression technique.

4. A method according to claim 3, wherein said parameters to be determined at least include focus and dose.

5. A method according to any of claims 2–4, wherein the regression technique used by the mathematical model is principal component regression (PCR).

6. A method according to any of claims 1–5, wherein the substrate comprises a test wafer.

7. A method according to any of claims 1–6, wherein the substrate comprises a product wafer.

8. A method according to any of claims 1–7, wherein the at least one diffractive structure is either positioned within the chip or in the scribe-lane.

9. A method of determining parameters, said method comprising:

- using a scatterometer to measure calibration spectra on a calibration focus-energy matrix (FEM);
- using a scatterometer to measure a spectrum of at least one diffractive structure of a substrate; and

based on the calibration spectra and the measured spectrum of the at least one diffractive structure, obtaining values of parameters relating to a lithographic exposure procedure.

10. The method according to claim 9, wherein said obtaining includes deriving parameters to be determined by employing a regression technique.

11. The method according to any of claims 9–10, wherein said obtaining includes applying a mathematical model which compares the calibration spectra on the calibration FEM with the measured spectrum on said substrate and derives the parameters to be determined by employing a regression technique.

12. A method according to any of claims 10–11, wherein the regression technique used by the mathematical model is principal component regression (PCR).

13. A method according to any of claims 9–12, wherein said obtaining includes performing a principal component analysis on at least a portion of the calibration spectra.

14. A method according to claim 13, wherein said obtaining includes constructing a model based on said principal component analysis.

15. A method according to any of claims 9–14, wherein said obtaining includes constructing a model based on at least a portion of the calibration spectra.

16. A method according to any of claims 9–15, wherein said parameters to be determined at least include focus and dose.

17. A method according to any of claims 9–16, wherein the substrate comprises a test wafer.

18. A method according to any of claims 9–17, wherein the substrate comprises a product wafer.

19. A method according to any of claims 9–18, wherein the at least one diffractive structure is either positioned within the chip or in the scribe-lane.

20. An apparatus configured to perform a method according to any of claims 1–19, wherein the apparatus comprises:
an illumination system for providing a beam of radiation;
- a support structure for supporting a patterning structure configured to impart the beam with a pattern in its cross-section;
- a substrate table for holding the substrate; and
- a projection system for projecting the patterned beam onto a target portion of the substrate.

Title of the Development
Method to separate dose and focus based on scatterometry spectra

State of the Art
Phase shift focus monitor can determine defocus (but not dose) Line-end-shortening can be used to monitor defocus. The sign of defocus, however, cannot be retrieved.

Problems of the Art
It is very difficult to discriminate between dose and focus when measuring CD variations. In general, special or multiple features are needed in combination with special or time consuming metrology (see above). Especially, determining the sign of defocus is difficult.

Short Description of a method according to an embodiment of the invention
Calculates dose and focus using scatterometry spectra and principal component analysis (PCA) 1. Calibration of a focus – dose model using scatterometry spectra from an experimental FEM 2. Predict dose and focus using scatterometry spectra as input for this model. PCA is used to extract the relevant information from the spectra and thereby reducing noise in experimental data. By compacting the data, better calibration models can be build. Repro (3σ): ΔF=30nm, ΔE=0.9% (based on comparing results obtained with H and V-iso lines exposures on an AT:1100 lithographic machine)

Potential Merits of the Development
Direct determination of scanner correctables instead of using the intermediate step of CD. No RCWA* needed: 1. at least some embodiments of the invention may be practiced without forehand knowledge of optical properties of materials 2. fast and simple prediction algorithm 3. Works, in principle, on all structures: 1D (standard for scatterometry), 2D, but also directly on-product * **Rigorous Coupled Wave Analysis:** complex algorithm to calculate spectra based on a theoretical resist grating and process stack. To extract grating parameters from the spectra, it may be desirable or necessary to solve the inverse problem.

Further Description of the Development

Principal Component Analysis (PCA) can be applied to obtain the basic spectra describing the complete series of spectra. These basic spectra are called the principal components.
In one example analysis as shown below, a scatterometry spectrum that consists of 644 points could be reduced to 5 basic spectra. These 5 basic spectra are linear combinations of the 644 points.
The basic spectra are used to calibrate a model with dose and focus.
This model can than be used to predict dose and focus, based on new spectra.

Calibration

Data (spectra) — Weights — Basic spectra — Weights — Focus — Dose

$$\begin{pmatrix} & 644 & \\ 576 & & \\ & & \end{pmatrix} \xrightarrow{SVD} \begin{pmatrix} 5 \\ 576 \\ \end{pmatrix} \cdot \begin{pmatrix} & 644 & \\ 5 & & \end{pmatrix}, \quad \begin{pmatrix} 5 \\ 576 \\ \end{pmatrix} \xrightarrow[\text{Regression}]{coef\_F\left(\;\right)5} \begin{pmatrix} 1 \\ 2 \\ \vdots \\ 24 \\ 1 \\ \vdots \end{pmatrix} \xrightarrow[coef\_E\left(\;\right)5]{} \begin{pmatrix} 1 \\ 1 \\ \vdots \\ 1 \\ 2 \\ \vdots \end{pmatrix} 576$$

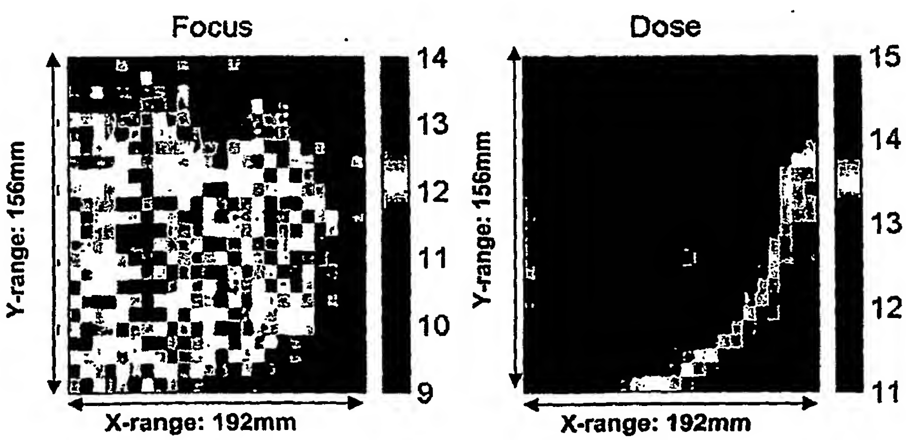
Verification and use

Data (spectra) — (Basic spectra)^T — Weights — Focus & Dose

$$\begin{pmatrix} & 644 & \end{pmatrix} \cdot \begin{pmatrix} 5 \\ 644 \\ \\ \end{pmatrix} = \begin{pmatrix} 5 \end{pmatrix} \begin{matrix} \xrightarrow{coef\_F\left(\;\right)5} F = \ldots \\ \text{Regression} \\ \xrightarrow[coef\_E\left(\;\right)5]{} E = \ldots \end{matrix}$$

Examples of experimental results

On AT:1100 (M3031) 576 fields are exposed at Best Focus and Best Energy, covering an area of 192 x 156 mm^2 on the wafer. Small fields, in the order of mm's, are used. For one position per field the scatterometer records a spectrum, which is used as input for the model.
The figure gives the result for the determined focus and dose across the wafer. Each step in focus is 20nm and each step in dose is 1.25%. In the dose plot a typical processing fingerprint (and one flyer) is seen.



Focus measurements with scatterometry

Hans van der Laan

December 2003

<file name>
<version 00>
<author>

Outline

- Introduction
- Experimental
- Principle
- Create model based on calibration step
- Results
- Correlation to other focus techniques
- Use of Scatterometry Focus Technique
- Conclusions

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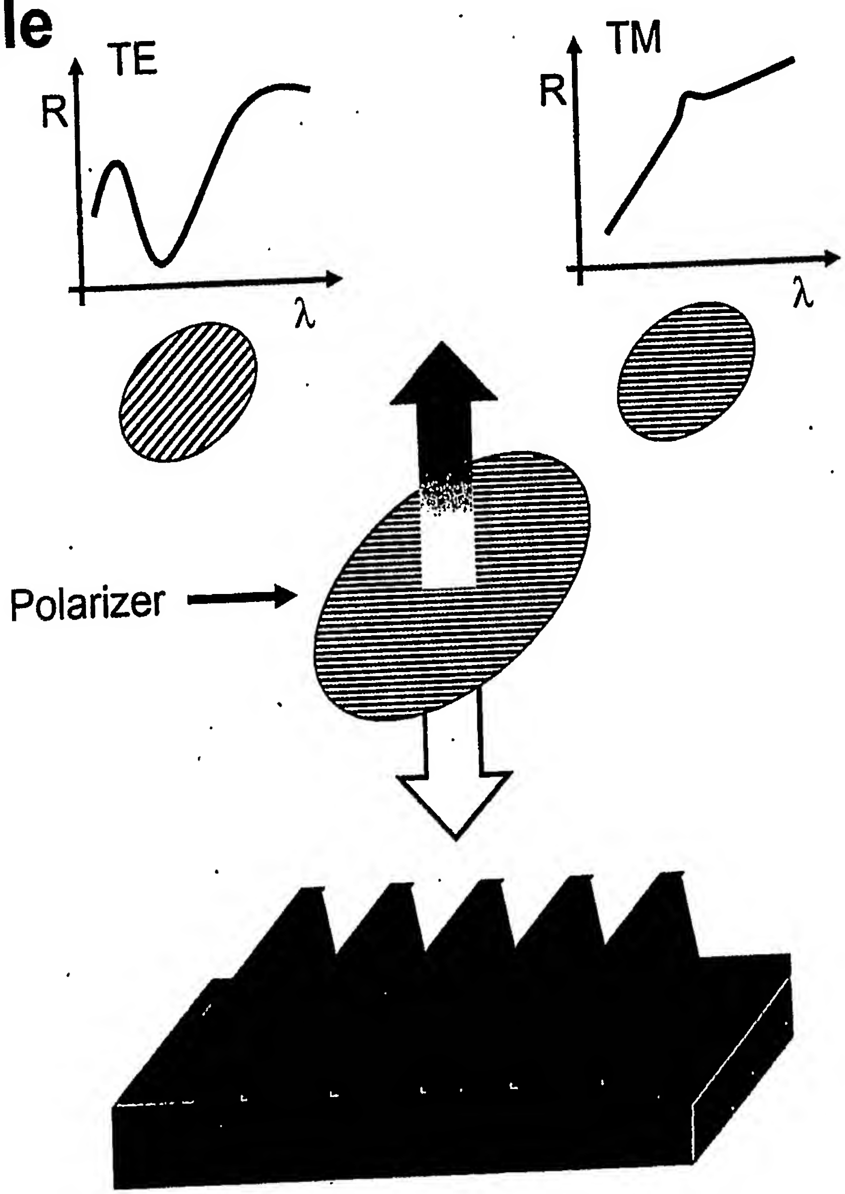
Scatterometry principle

- Measure reflectance as a function of
  - Wavelength
  - Polarizer orientation: TE or TM
- Scatterometry types
  - Reflectometer
    perpendicular incidence
    polarized & non-polarized
  - Ellipsometer
    Oblique incidence



Introduction

- Two ways-of-working with scatterometry
  - Use optical constants of materials + complex calculations (inverse Maxwell) to derive CD-values from spectra (standard)
  - Direct translation of spectra into Focus and Dose values, using an experimental calibration step (proposed here)
    - Advantage: outputs are the scanner adjustables
- Concept
  - Spectra contains info on resist profile (focus dependent)
  - No special mask necessary as for PSFM / LVT tests
  - Accuracy will depend on Scatterometry and resist type

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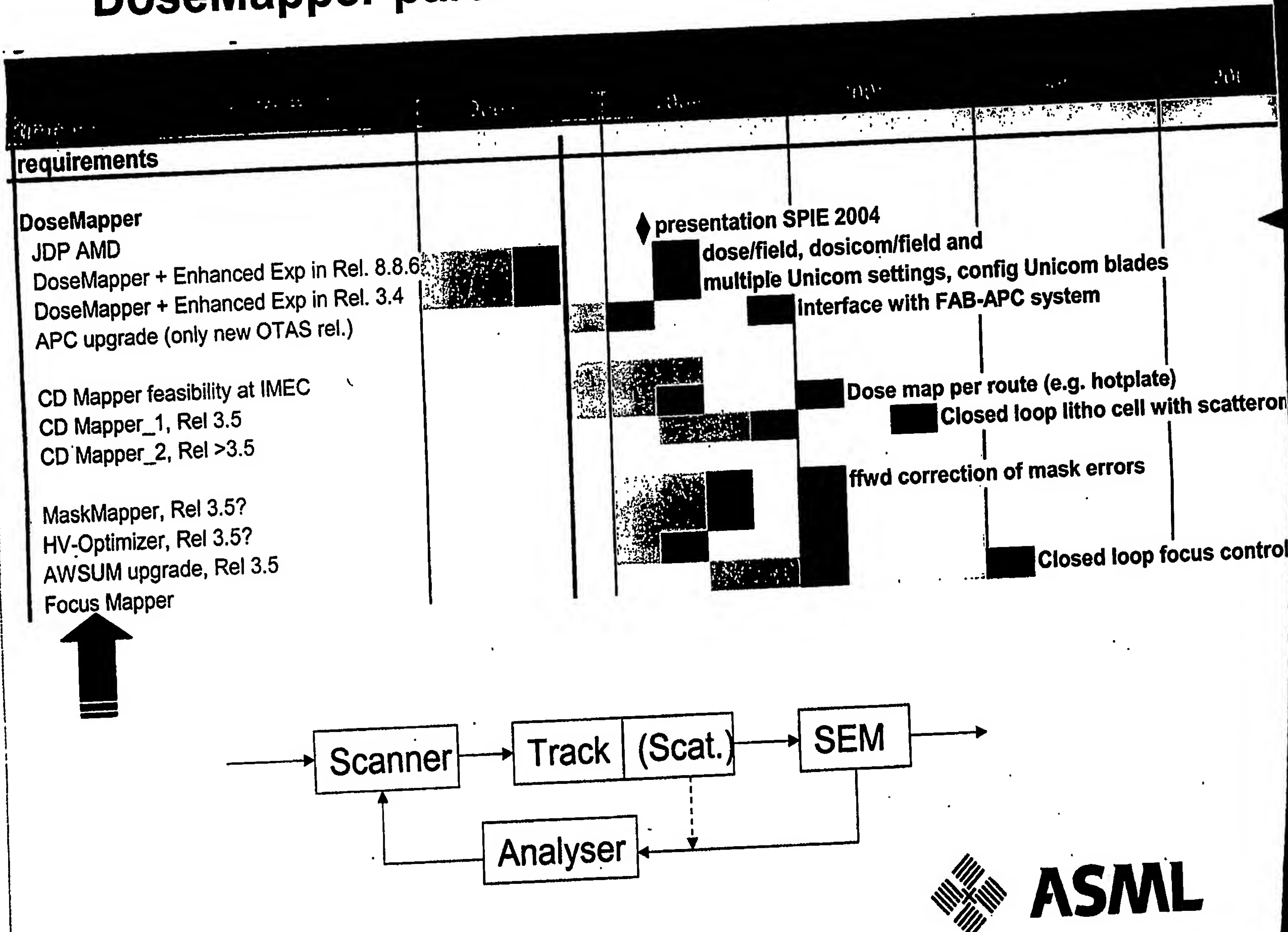
DoseMapper part of ISD-roadmap



Experimental

- AT:850, M8868, NA=0.8, σ=0.85/0.55
- 110nm isolated line (pitch 1:6, binary mask)
- Wafers from MEMC, deliberately made unflat
  - Re-coated and re-exposed several times for the different tests
- Scatterometer KT SpectraCD
  - Oblique incidence, MAM = 4s/pt (Move - Acquired - Measure)
- Calibration on 13x9 mini FEM (flat wafer)
  - Focus: -300 $\Rightarrow$ 60nm, Dose: 26 $\Rightarrow$ 32 mJ/cm^2
- Scatterometry read-out on ELM-Scat FWCDU wafers
- Focus tests to correlate with:
  - Levelling Verification Test (LVT)
  - Wafer Map, MA

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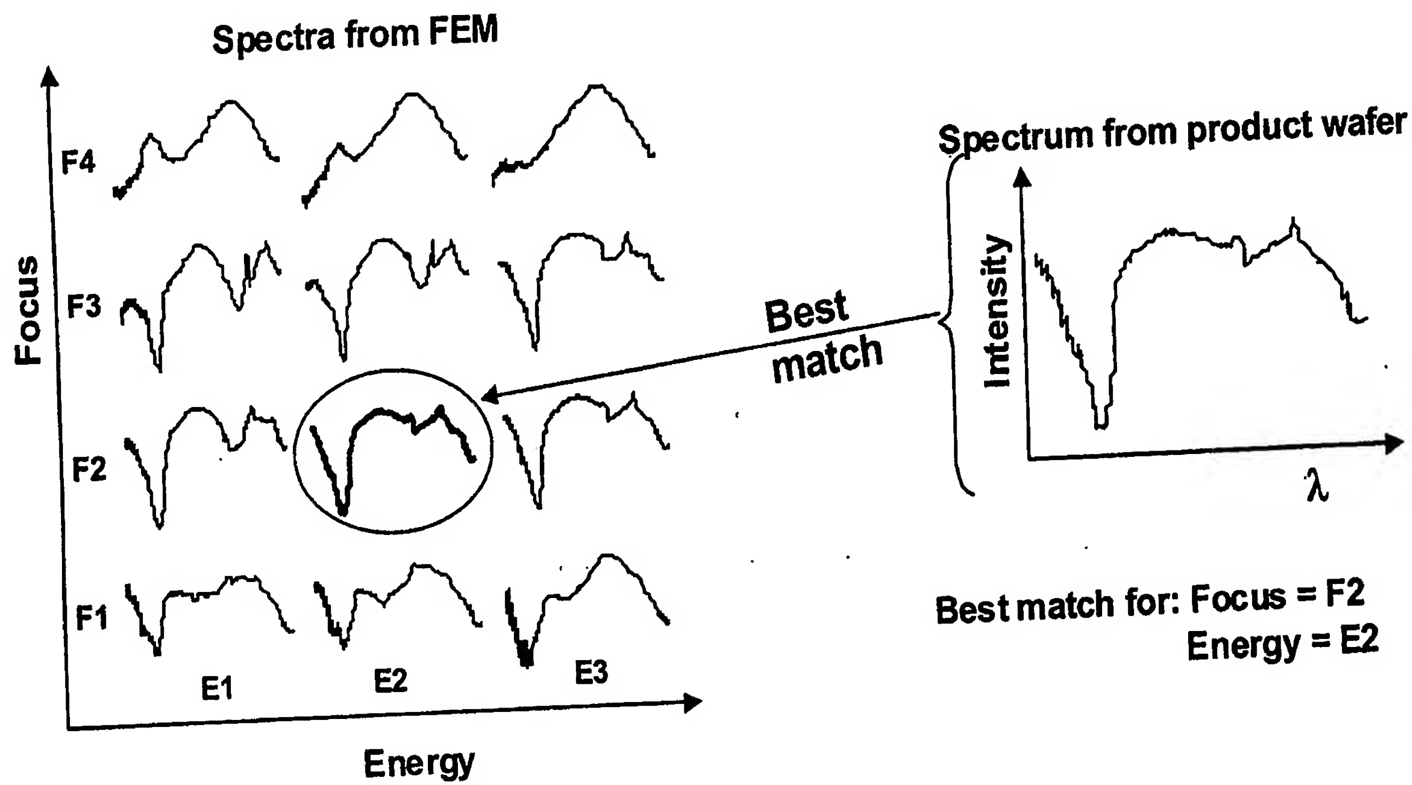
Principle

Calibration with FEM

Focus & Dose determination on product wafer



Best match for: Focus = F2
Energy = E2

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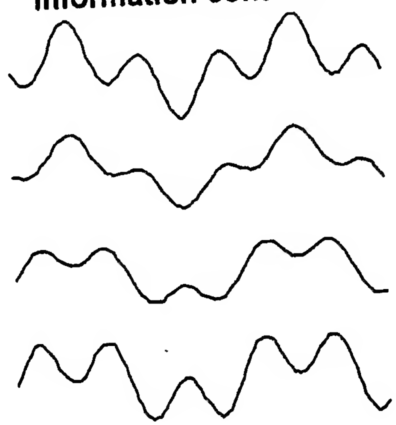
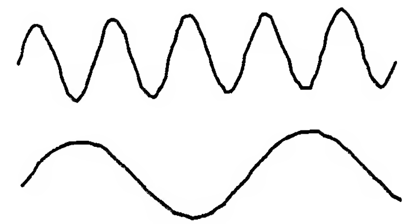
Principle of PCR

Information content?

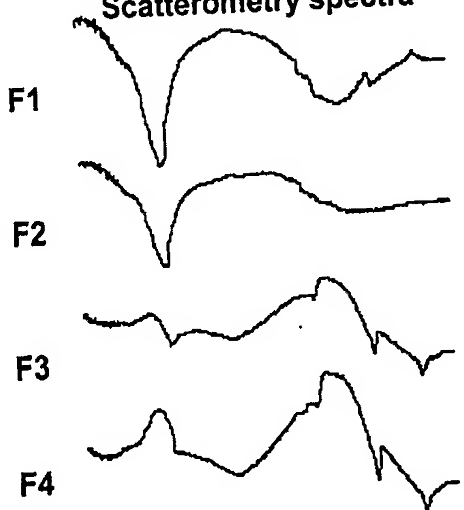


H1	H3
1	-1
1	-1/2
1	+1/2
1	1

Harmonics



Scatterometry spectra



PC1	PC2
1	-1
1	-1/2
1	+1/2
1	1

Relation described with regression

Principal components

Principle Component Regression [RCar]

Calibration

Data (spectra) — Weights — Basic spectra — Weights — Focus — Dose

$$\underbrace{\begin{pmatrix} & 644 & \\ 576 & & \\ & & \end{pmatrix}}_{\text{Data (spectra)}} \xrightarrow{SVD} \underbrace{\begin{pmatrix} 5 \\ 576 \\ \end{pmatrix}}_{\text{Weights}} \cdot \underbrace{\begin{pmatrix} 5 & 644 \end{pmatrix}}_{\text{Basic spectra}}, \quad \underbrace{\begin{pmatrix} 5 \\ 576 \end{pmatrix}}_{\text{Weights}} \xrightarrow[coef\_E\,(\;)\,5]{coef\_F\,(\;)\,5 \quad \text{Regression}} \underbrace{\begin{pmatrix} 1 \\ 2 \\ \vdots \\ 24 \\ 1 \\ \vdots \end{pmatrix}}_{\text{Focus}} \underbrace{\begin{pmatrix} 1 \\ 1 \\ \vdots \\ 1 \\ 2 \\ \vdots \end{pmatrix}}_{\text{Dose}} 576$$

Verification and use

Data (spectra) — (Basic spectra)^T — Weights — Focus & Dose

$$\underbrace{\begin{pmatrix} 644 \end{pmatrix}}_{\text{Data (spectra)}} \cdot \underbrace{\begin{pmatrix} 5 \\ 644 \\ \end{pmatrix}}_{(\text{Basic spectra})^T} = \underbrace{\begin{pmatrix} 5 \end{pmatrix}}_{\text{Weights}} \xrightarrow{coef\_F\,(\;)\,5} F = \ldots$$

$$\xrightarrow[coef\_E\,(\;)\,5]{\text{Regression}} E = \ldots$$

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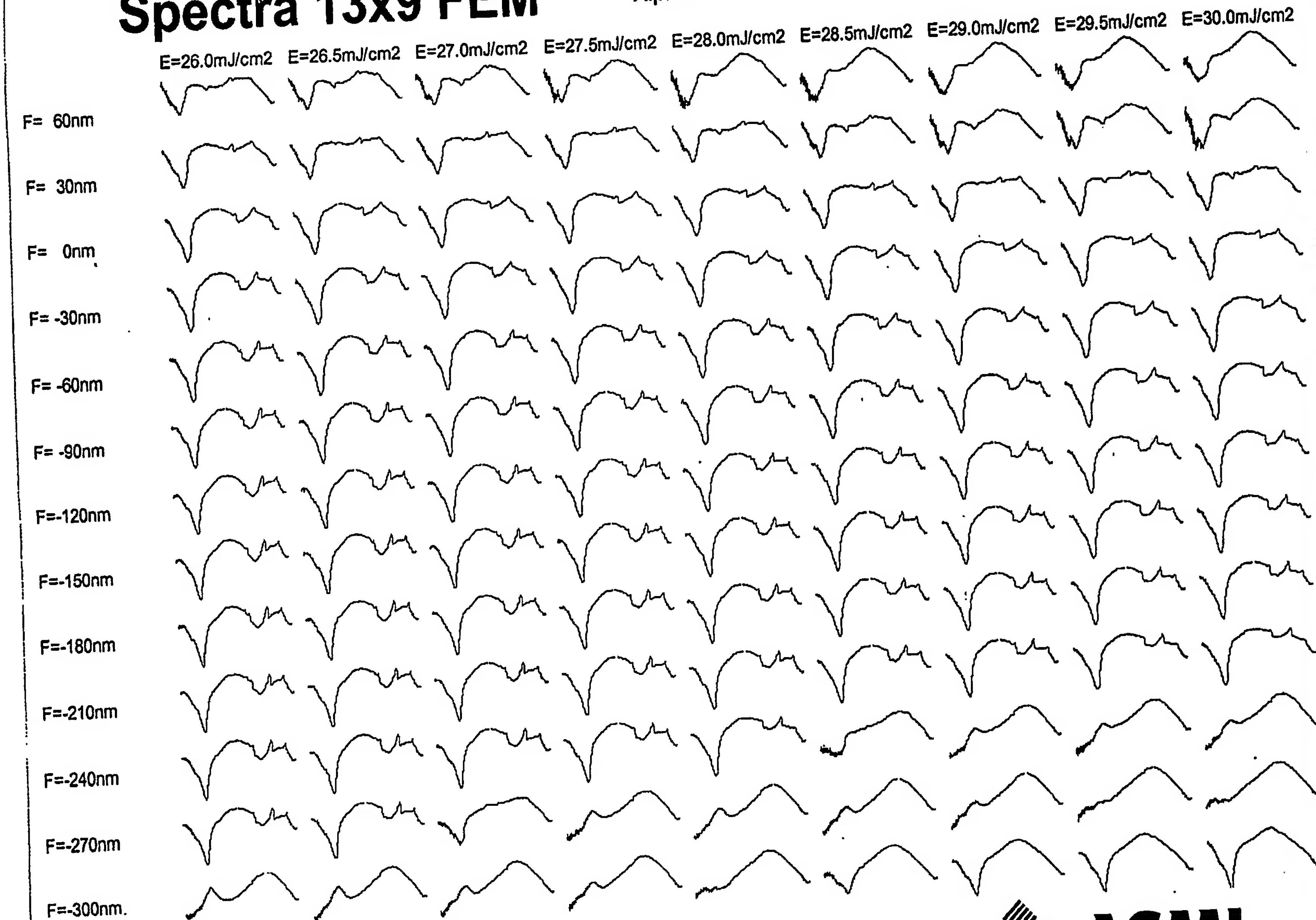
Spectra 13x9 FEM

Alpha



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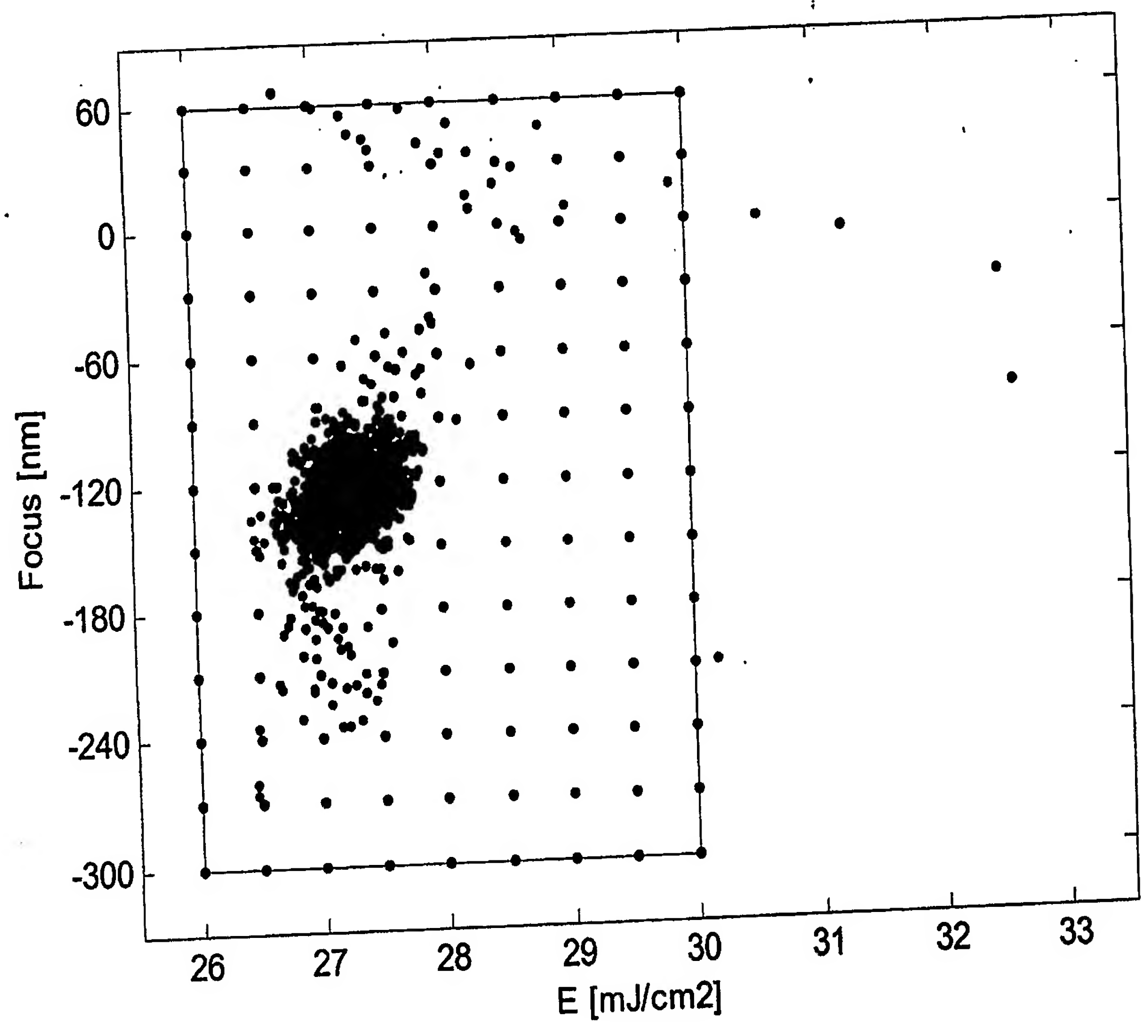
/ Slide 10

Apply model to Full Wafer spectra



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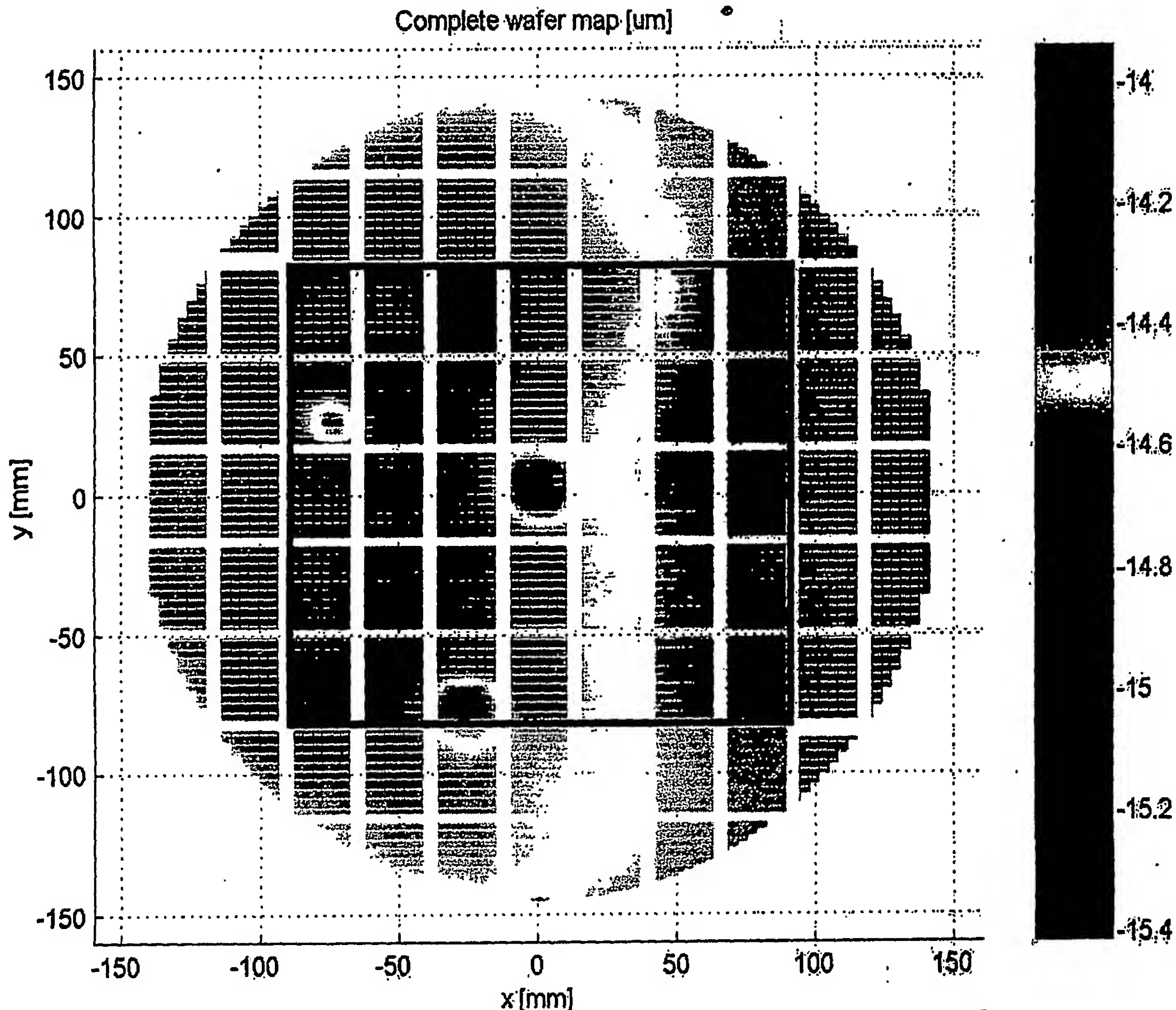
Wafer map - MEMC-C



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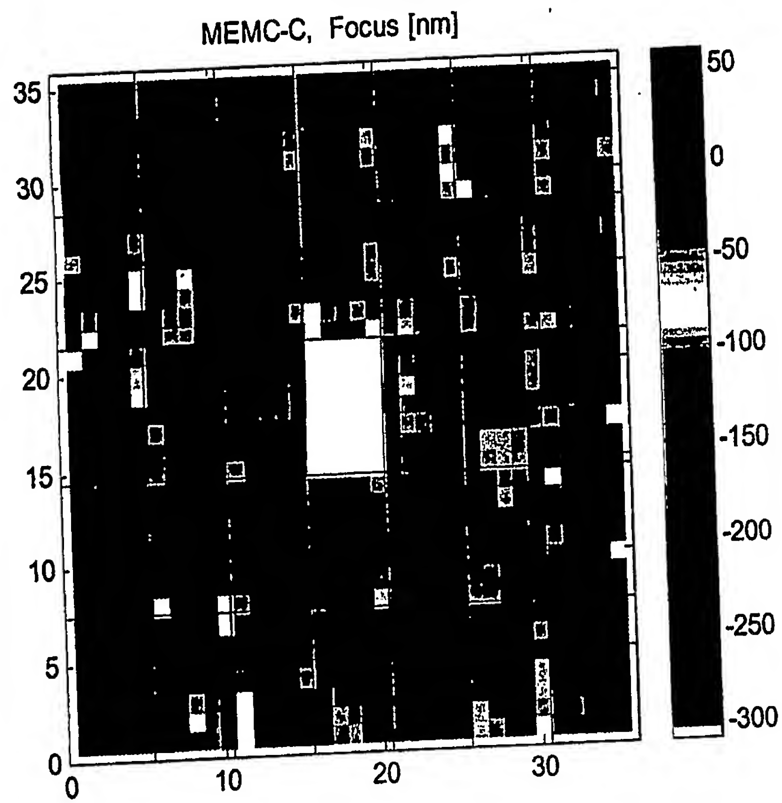
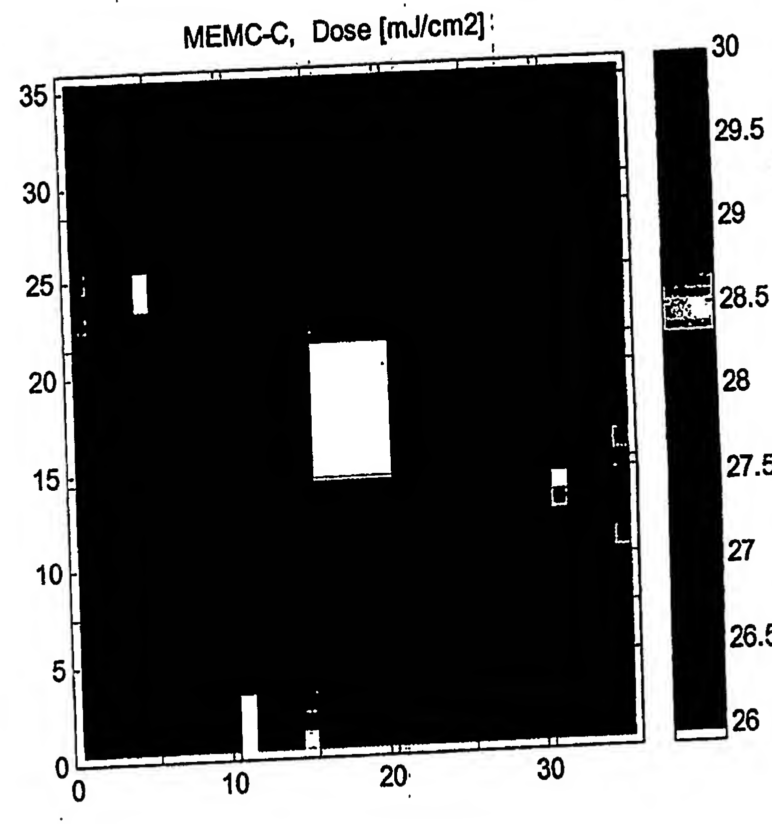
/ Slide 12

Focus & Dose measurements with scatterometry





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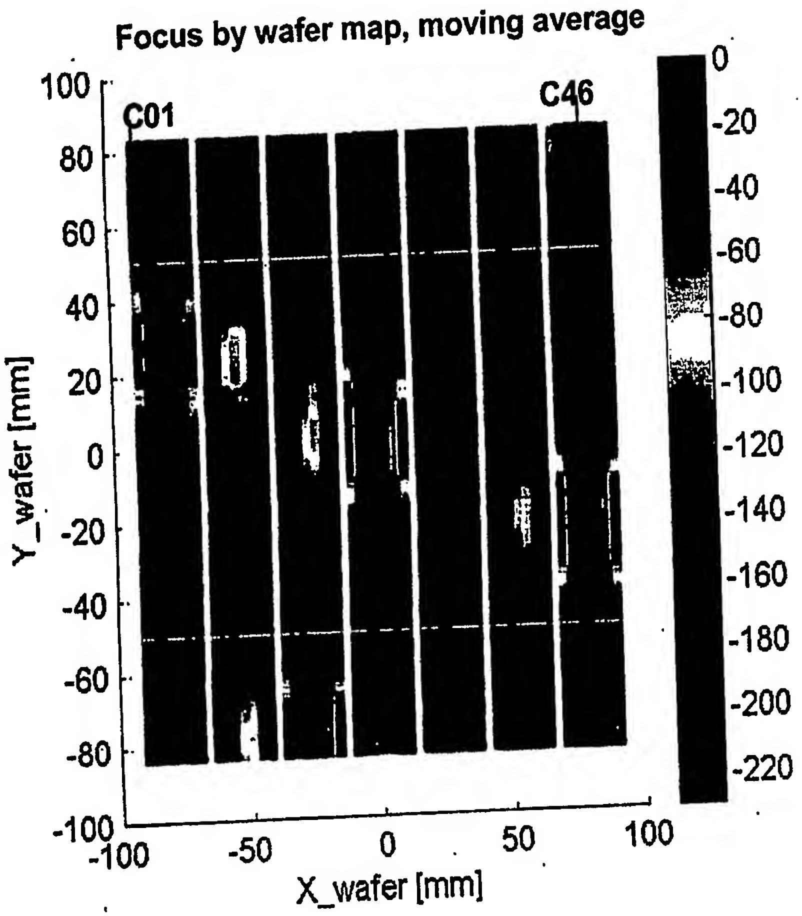
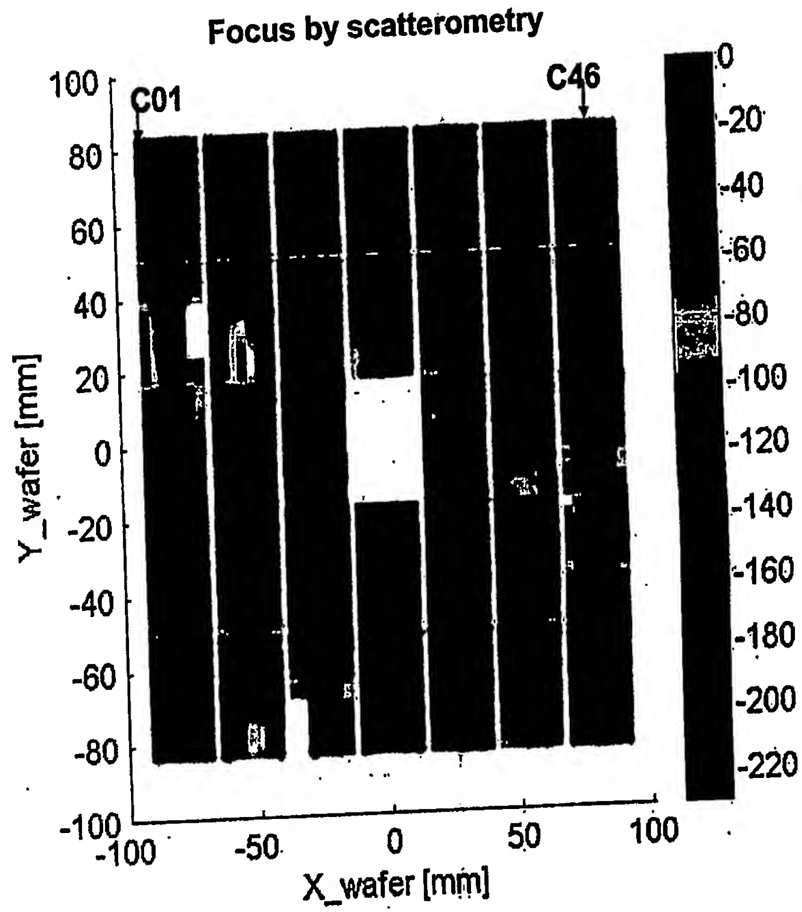
Focus by Wafer map (MA) vs. scatterometry





- Scatterometry data interpolated to MA grid
- -125nm subtracted from MA data

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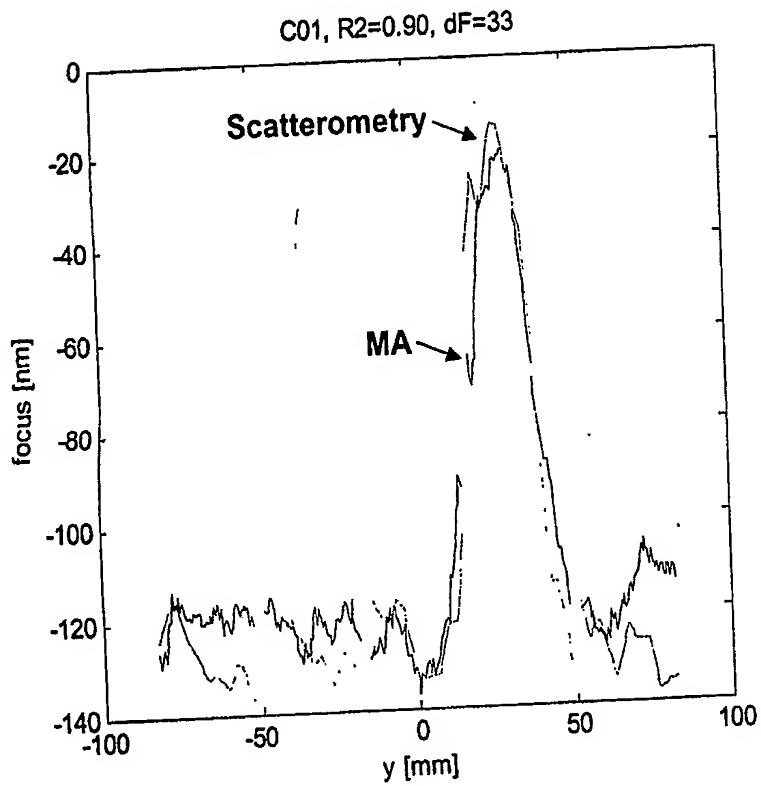
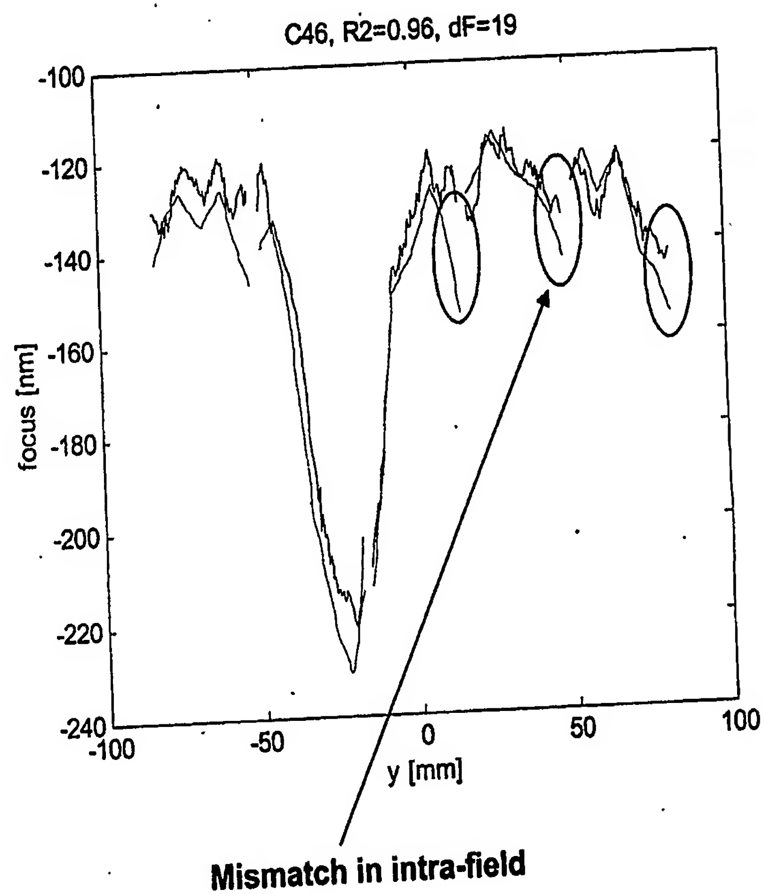
Focus by MA vs. scatterometry





Plot of columns 1 and 46

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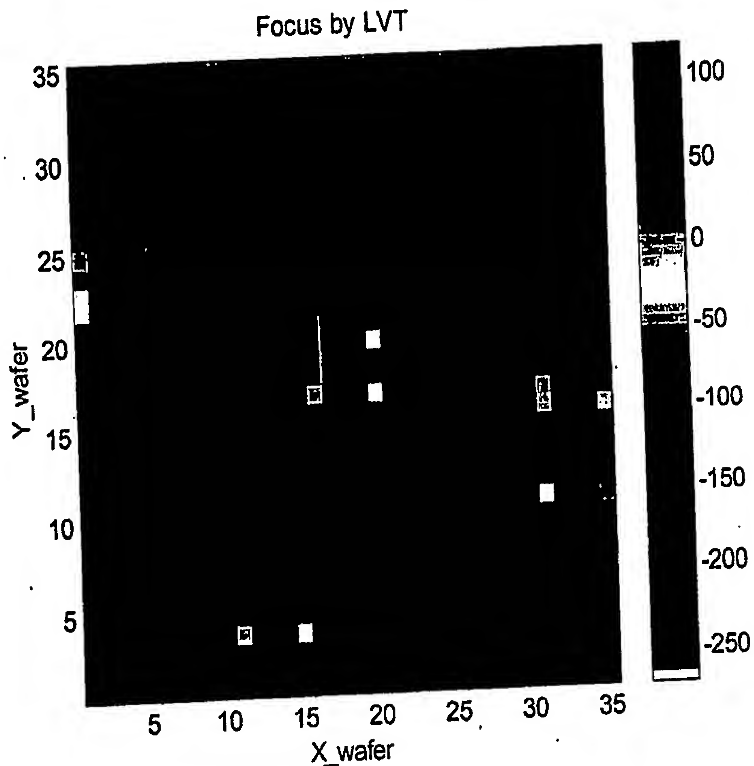
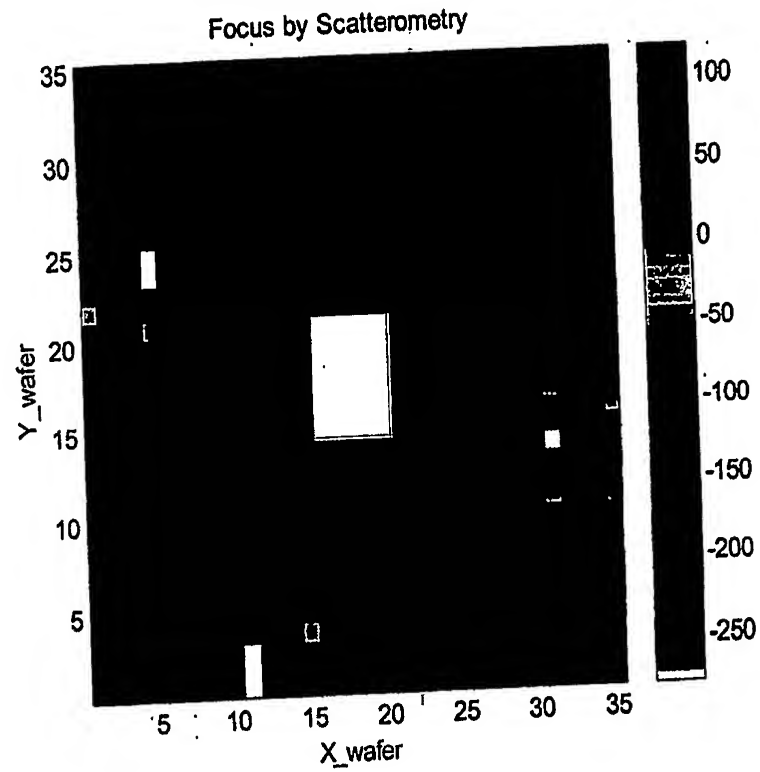
/ Slide 15

Focus by LVT vs. scatterometry





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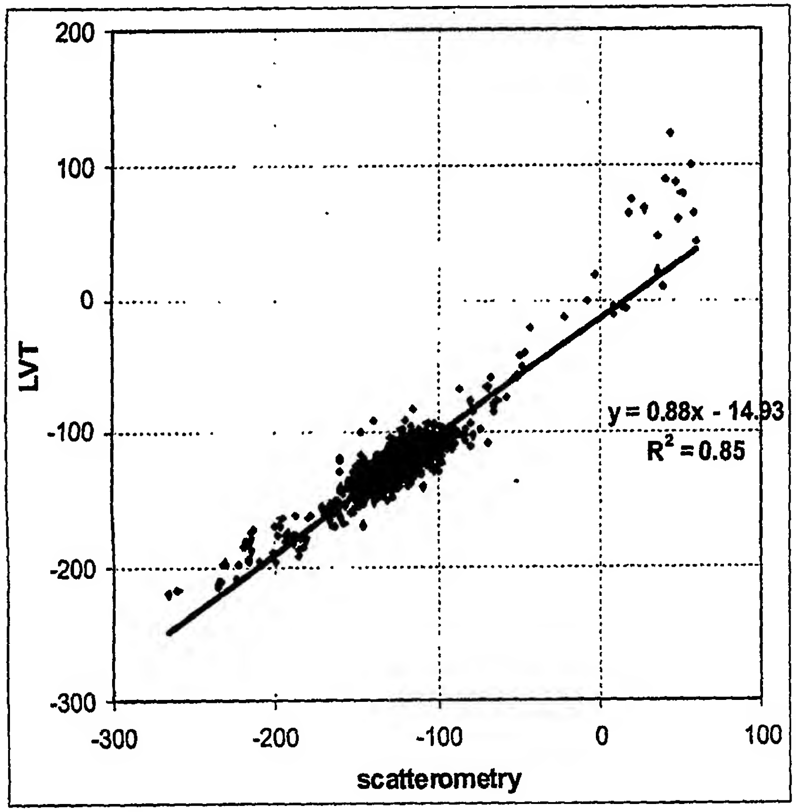
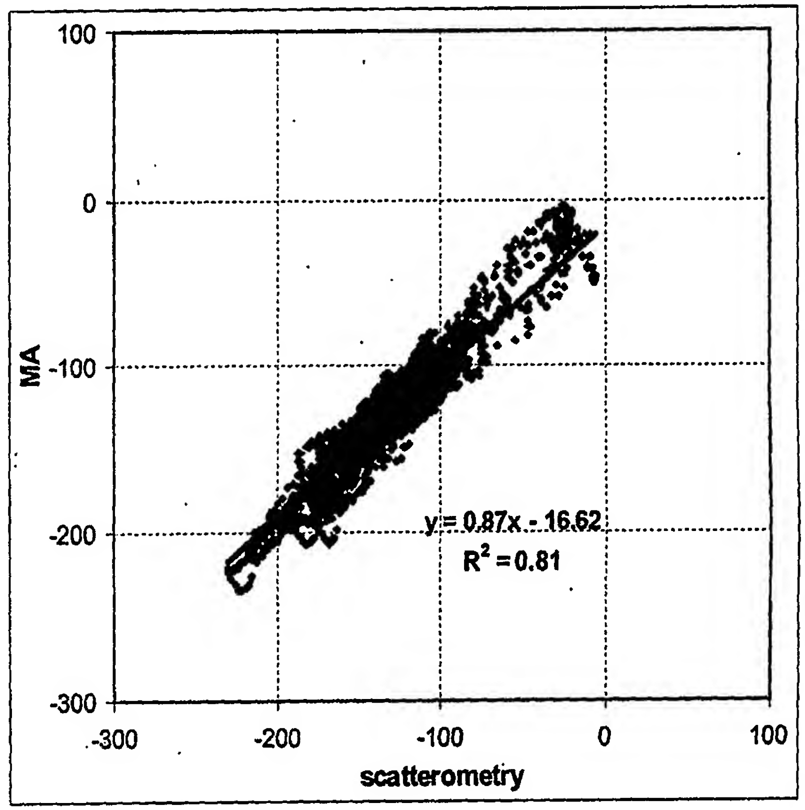
Correlation plots (intra-field difference subtracted)

Scatterometry vs. LVT



Scatterometry vs. MA



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Accuracy

- Correlation

	MA			LVT		
	dF [nm 3σ]	slope	R^2	dF [nm 3σ]	slope	R^2
MEMC_C, α	26	0.87	0.81	36	0.88	0.85
β	25	0.93	0.77	36	0.87	0.76
MEMC_D, α	31	0.81	0.71	37	0.81	0.81
β	27	0.90	0.73	36	0.81	0.74
Average	**27**	**0.88**	**0.75**	**36**	**0.85**	**0.79**

Intra-field difference subtracted

- Accuracy (3σ) < 25nm
  - Based on correlation results
  - Example: Ry accuracy < 0.2µm (3σ), using 75 measurements

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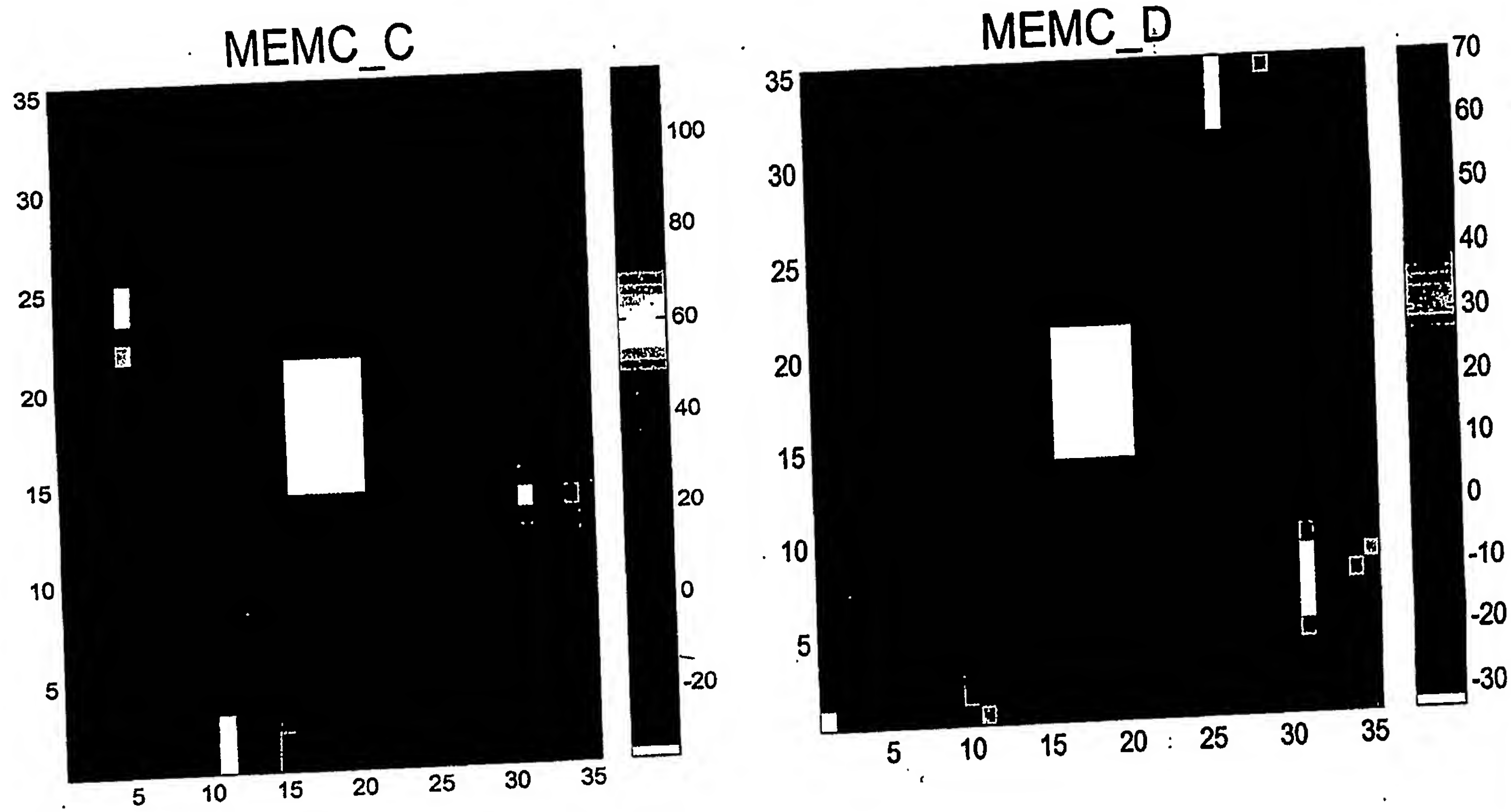
Use of Scatterometry Focus Technique

Residual of the LVT/Scatterometry correlation



LVT and scatterometry are based on a separate exposure
Focus offset differences between the two exposures are seen

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Conclusions

- Good correlation with LVT and Wafer Map, MA-data
- Accuracy of Focus by Scatterometry <25nm (3σ)

- Scatterometry is flexible since it works
  - with all mask types
  - with all illumination settings
  - on test wafers, on scribe-lane and within chip (as long as calibration done on the same substrate)
  - with test structures / chip structures

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Possible further experiments

- Use of the Scatterometry Focus Technique
  - Adjust focus knobs for imaging structure and resist
    - Compare with FOCAL
    - Does CD-Uniformity improve?
  - Repeat experiment on production like structure
    - E.g. Brick Wall, Contact Holes, real product reticle??
  - On top of product
    - Calibration: Expose a FEM, rework wafer after read-out
    - Use on the to-be-measured-wafers (Full Wafer Coverage)

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Possible further experiments

- New investigations
  - Use MA data for calibration step
  - Determine absolute BF directly from Focus Meander
  - Investigate dependency on resist and scatterometry type
  - Investigate dependency on process variation other than Focus/Dose
    - Try to decrease dependency

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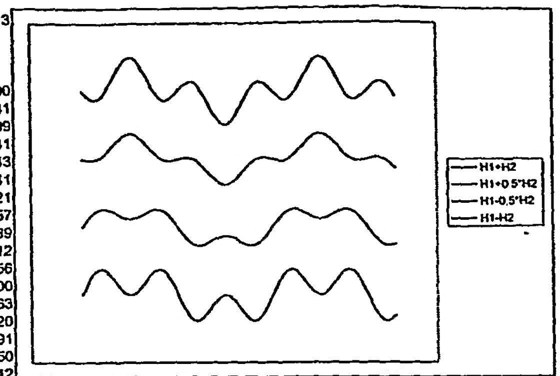
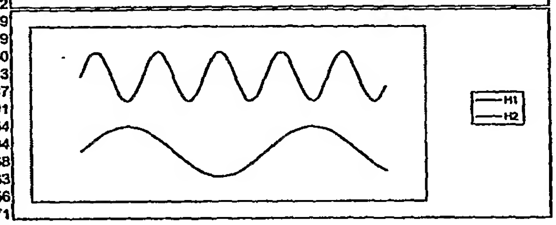
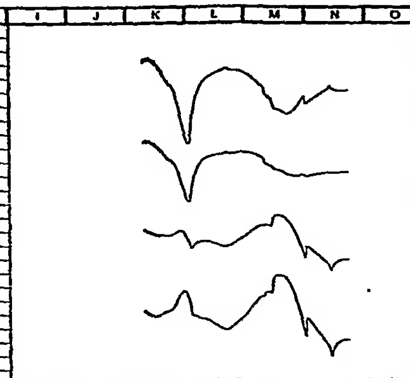
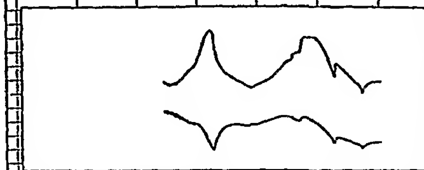
			H1+H2	H1+0.5*H2	H1-0.5*H2	H1-H2	H1	H2
			4	8	12	16	0	3
0	0.000	0.000	4.000	8.000	12.000	16.000	0.000	3.000
1	0.327	0.841	5.169	8.748	11.906	15.486	0.327	3.841
2	0.618	0.909	5.528	9.073	12.164	15.709	0.618	3.909
3	0.841	0.141	4.983	8.912	12.771	16.700	0.841	3.141
4	0.972	-0.757	4.215	8.594	13.350	17.729	0.972	2.243
5	0.995	-0.959	4.036	8.516	13.475	17.954	0.995	2.041
6	0.909	-0.279	4.630	8.770	13.049	17.189	0.909	2.721
7	0.723	0.657	5.380	9.052	12.395	16.066	0.723	3.657
8	0.457	0.989	5.447	8.952	11.963	15.468	0.457	3.989
9	0.141	0.412	4.553	8.347	11.935	15.729	0.141	3.412
10	-0.191	-0.544	3.265	7.537	12.081	16.353	-0.191	2.456
11	-0.501	-1.000	2.499	6.999	11.999	16.499	-0.501	2.000
12	-0.757	-0.537	2.707	6.975	11.511	15.780	-0.757	2.463
13	-0.929	0.420	3.491	7.281	10.861	14.651	-0.929	3.420
14	-0.999	0.991	3.992	7.496	10.506	14.010	-0.999	3.991
15	-0.959	0.650	3.691	7.366	10.716	14.391	-0.959	3.650
16	-0.813	-0.288	2.899	7.043	11.331	15.475	-0.813	2.712
17	-0.578	-0.961	2.460	6.941	11.903	16.383	-0.578	2.039
18	-0.279	-0.751	2.970	7.345	12.098	16.472	-0.279	2.249
19	0.050	0.150	4.200	8.125	11.975	15.900	0.050	3.150
20	0.374	0.913	5.287	8.831	11.918	15.461	0.374	3.913
21	0.657	0.837	5.494	9.075	12.239	15.820	0.657	3.837
22	0.867	-0.009	4.859	8.863	12.872	16.876	0.867	2.991
23	0.983	-0.846	4.136	8.559	13.406	17.829	0.983	2.154
24	0.989	-0.906	4.084	8.537	13.442	17.895	0.989	2.094
25	0.887	-0.132	4.755	8.821	12.953	17.020	0.887	2.868
26	0.688	0.763	5.450	9.069	12.306	15.925	0.688	3.763
27	0.412	0.956	5.368	8.890	11.934	15.456	0.412	3.956
28	0.091	0.271	4.362	8.227	11.956	15.820	0.091	3.271
29	-0.240	-0.664	3.097	7.429	12.092	16.424	-0.240	2.336
30	-0.544	-0.988	2.468	6.962	11.950	16.444	-0.544	2.012
31	-0.789	-0.404	2.807	7.009	11.413	15.615	-0.789	2.596





	A	B	C	D	E	F	G
1							
2			0.1400	0	0.15	0.3	0.45
3							
4							
5	PC2	PC1	PC2	PC1+PC2	PC1+0.5*	PC1-0.5*F	PC1-PC2
6	-0.0241	0.0550	0.1159	0.0309	0.1929	0.3670	0.5291
7	-0.0282	0.0557	0.1118	0.0275	0.1916	0.3696	0.5339
8	-0.0269	0.0588	0.1131	0.0319	0.1953	0.3723	0.5358
9	-0.0267	0.0582	0.1133	0.0316	0.1949	0.3716	0.5349
10	-0.0287	0.0555	0.1113	0.0268	0.1912	0.3699	0.5342
11	-0.0299	0.0586	0.1101	0.0287	0.1937	0.3735	0.5384
12	-0.0280	0.0588	0.1120	0.0307	0.1948	0.3728	0.5368
13	-0.0268	0.0575	0.1134	0.0309	0.1942	0.3706	0.5342
14	-0.0278	0.0550	0.1122	0.0272	0.1911	0.3688	0.5327
15	-0.0264	0.0570	0.1136	0.0305	0.1936	0.3702	0.5334
16	-0.0297	0.0549	0.1103	0.0253	0.1901	0.3697	0.5346
17	-0.0290	0.0597	0.1110	0.0307	0.1952	0.3742	0.5386
18	-0.0299	0.0555	0.1101	0.0258	0.1906	0.3705	0.5355
19	-0.0286	0.0555	0.1114	0.0270	0.1913	0.3698	0.5341
20	-0.0292	0.0540	0.1108	0.0248	0.1894	0.3686	0.5333
21	-0.0304	0.0558	0.1096	0.0254	0.1906	0.3710	0.5363
22	-0.0295	0.0517	0.1105	0.0221	0.1869	0.3664	0.5312
23	-0.0315	0.0530	0.1085	0.0215	0.1873	0.3687	0.5345
24	-0.0325	0.0562	0.1075	0.0238	0.1900	0.3724	0.5387
25	-0.0293	0.0567	0.1107	0.0273	0.1920	0.3713	0.5360
26	-0.0341	0.0571	0.1059	0.0231	0.1901	0.3742	0.5412
27	-0.0310	0.0542	0.1090	0.0232	0.1887	0.3697	0.5351
28	-0.0308	0.0538	0.1094	0.0231	0.1885	0.3691	0.5344
29	-0.0306	0.0554	0.1094	0.0249	0.1901	0.3707	0.5360
30	-0.0315	0.0554	0.1085	0.0239	0.1898	0.3711	0.5369
31	-0.0298	0.0552	0.1102	0.0255	0.1904	0.3701	0.5350
32	-0.0320	0.0524	0.1080	0.0204	0.1864	0.3683	0.5343
33	-0.0300	0.0543	0.1100	0.0243	0.1893	0.3692	0.5342
34	-0.0344	0.0549	0.1056	0.0206	0.1878	0.3721	0.5393
35	-0.0299	0.0526	0.1101	0.0227	0.1876	0.3675	0.5325
36	-0.0317	0.0562	0.1083	0.0245	0.1903	0.3720	0.5379
37	-0.0320	0.0536	0.1080	0.0218	0.1876	0.3696	0.5356
38	-0.0313	0.0514	0.1087	0.0200	0.1857	0.3670	0.5327
39	-0.0323	0.0568	0.1077	0.0245	0.1906	0.3729	0.5391
40	-0.0308	0.0555	0.1092	0.0247	0.1901	0.3709	0.5363
41	-0.0328	0.0506	0.1072	0.0178	0.1842	0.3670	0.5334
42	-0.0319	0.0533	0.1081	0.0213	0.1873	0.3692	0.5352
43	-0.0292	0.0509	0.1108	0.0217	0.1863	0.3656	0.5301
44	-0.0300	0.0513	0.1100	0.0214	0.1864	0.3663	0.5313
45	-0.0319	0.0514	0.1081	0.0195	0.1854	0.3673	0.5332
46	-0.0323	0.0540	0.1077	0.0216	0.1878	0.3701	0.5363
47	-0.0307	0.0511	0.1093	0.0204	0.1858	0.3665	0.5318
48	-0.0301	0.0500	0.1099	0.0198	0.1849	0.3651	0.5301
49	-0.0293	0.0495	0.1107	0.0202	0.1849	0.3641	0.5288
50	-0.0298	0.0494	0.1102	0.0197	0.1846	0.3643	0.5292
51	-0.0312	0.0516	0.1088	0.0204	0.1860	0.3672	0.5328
52	-0.0304	0.0507	0.1096	0.0203	0.1855	0.3658	0.5310
53	-0.0301	0.0528	0.1099	0.0227	0.1878	0.3679	0.5330
54	-0.0284	0.0482	0.1116	0.0198	0.1840	0.3625	0.5267
55	-0.0273	0.0483	0.1127	0.0210	0.1847	0.3620	0.5256
56	-0.0283	0.0467	0.1117	0.0184	0.1825	0.3609	0.5250
57	-0.0333	0.0511	0.1067	0.0178	0.1844	0.3677	0.5343
58	-0.0286	0.0471	0.1114	0.0186	0.1828	0.3614	0.5257
59	-0.0313	0.0523	0.1087	0.0209	0.1866	0.3679	0.5336
60	-0.0282	0.0504	0.1118	0.0222	0.1863	0.3648	0.5287
61	-0.0282	0.0481	0.1118	0.0199	0.1840	0.3622	0.5263
62	-0.0294	0.0493	0.1106	0.0199	0.1846	0.3640	0.5287
63	-0.0274	0.0452	0.1126	0.0178	0.1815	0.3589	0.5226
64	-0.0326	0.0518	0.1074	0.0191	0.1854	0.3681	0.5344
65	-0.0289	0.0487	0.1111	0.0198	0.1842	0.3631	0.5276
66	-0.0301	0.0472	0.1099	0.0171	0.1821	0.3622	0.5273
67	-0.0286	0.0501	0.1114	0.0215	0.1858	0.3645	0.5288
68	-0.0253	0.0480	0.1147	0.0228	0.1854	0.3607	0.5233
69	-0.0286	0.0493	0.1115	0.0207	0.1850	0.3636	0.5278
70	-0.0285	0.0478	0.1115	0.0193	0.1836	0.3620	0.5262
71	-0.0277	0.0484	0.1123	0.0207	0.1846	0.3623	0.5261
72	-0.0280	0.0474	0.1120	0.0194	0.1834	0.3614	0.5253
73	-0.0271	0.0462	0.1129	0.0191	0.1827	0.3597	0.5233
74	-0.0269	0.0474	0.1131	0.0205	0.1839	0.3609	0.5243
75	-0.0278	0.0473	0.1124	0.0197	0.1835	0.3611	0.5249
76	-0.0235	0.0425	0.1165	0.0190	0.1808	0.3543	0.5160
77	-0.0246	0.0476	0.1154	0.0230	0.1863	0.3599	0.5223
78	-0.0264	0.0483	0.1136	0.0219	0.1851	0.3615	0.5247
79	-0.0231	0.0442	0.1169	0.0211	0.1827	0.3557	0.5173
80	-0.0225	0.0455	0.1175	0.0230	0.1842	0.3568	0.5180
81	-0.0221	0.0426	0.1179	0.0205	0.1816	0.3537	0.5147
82	-0.0235	0.0462	0.1165	0.0227	0.1845	0.3579	0.5197
83	-0.0240	0.0472	0.1160	0.0232	0.1852	0.3592	0.5212
84	-0.0226	0.0430	0.1174	0.0204	0.1817	0.3543	0.5156
85	-0.0220	0.0423	0.1180	0.0203	0.1813	0.3533	0.5143
86	-0.0211	0.0443	0.1189	0.0232	0.1837	0.3548	0.5154
87	-0.0226	0.0469	0.1172	0.0242	0.1856	0.3583	0.5197
88	-0.0202	0.0448	0.1198	0.0246	0.1847	0.3549	0.5150
89	-0.0192	0.0422	0.1208	0.0230	0.1826	0.3518	0.5114
90	-0.0196	0.0433	0.1204	0.0237	0.1835	0.3531	0.5129
91	-0.0205	0.0443	0.1195	0.0238	0.1841	0.3546	0.5148
92	-0.0205	0.0446	0.1195	0.0241	0.1843	0.3549	0.5151
93	-0.0171	0.0406	0.1229	0.0235	0.1821	0.3492	0.5078
94	-0.0194	0.0434	0.1206	0.0240	0.1837	0.3531	0.5128
95	-0.0179	0.0428	0.1221	0.0248	0.1838	0.3517	0.5107
96	-0.0198	0.0451	0.1202	0.0253	0.1852	0.3550	0.5149
97	-0.0172	0.0430	0.1228	0.0258	0.1844	0.3516	0.5102
98	-0.0196	0.0438	0.1204	0.0242	0.1840	0.3536	0.5134
99	-0.0133	0.0416	0.1267	0.0283	0.1860	0.3483	0.5050
100	-0.0157	0.0404	0.1243	0.0247	0.1825	0.3483	0.5061
101	-0.0137	0.0398	0.1263	0.0261	0.1830	0.3487	0.5036
102	-0.0134	0.0399	0.1266	0.0265	0.1832	0.3468	0.5033
103	-0.0141	0.0411	0.1259	0.0270	0.1840	0.3482	0.5052
104	-0.0117	0.0388	0.1283	0.0272	0.1830	0.3447	0.5005
105	-0.0132	0.0397	0.1268	0.0264	0.1830	0.3463	0.5029
106	-0.0138	0.0412	0.1262	0.0274	0.1843	0.3481	0.5050
107	-0.0129	0.0396	0.1271	0.0267	0.1832	0.3461	0.5026
108	-0.0118	0.0394	0.1282	0.0276	0.1835	0.3452	0.5011
109	-0.0115	0.0396	0.1285	0.0280	0.1838	0.3453	0.5011
110	-0.0108	0.0392	0.1292	0.0285	0.1839	0.3446	0.5000
111	-0.0116	0.0387	0.1284	0.0271	0.1829	0.3445	0.5003
112	-0.0087	0.0386	0.1313	0.0298	0.1842	0.3429	0.4972
113	-0.0080	0.0381	0.1320	0.0301	0.1841	0.3421	0.4961





	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
114	-0.0068	0.0378	0.1312	0.0291	0.1834	0.3422	0.4966															
115	-0.0090	0.0385	0.1310	0.0295	0.1840	0.3430	0.4976															
116	-0.0075	0.0362	0.1325	0.0287	0.1824	0.3399	0.4936															
117	-0.0081	0.0358	0.1319	0.0278	0.1816	0.3397	0.4937															
118	-0.0082	0.0348	0.1338	0.0284	0.1815	0.3376	0.4907															
119	-0.0060	0.0358	0.1340	0.0298	0.1828	0.3388	0.4918															
120	-0.0063	0.0353	0.1347	0.0299	0.1826	0.3380	0.4906															
121	-0.0050	0.0353	0.1350	0.0303	0.1828	0.3378	0.4903															
122	-0.0059	0.0350	0.1341	0.0290	0.1820	0.3379	0.4909															
123	-0.0049	0.0343	0.1351	0.0293	0.1818	0.3367	0.4892															
124	-0.0065	0.0369	0.1335	0.0304	0.1837	0.3402	0.4934															
125	-0.0033	0.0337	0.1367	0.0304	0.1821	0.3353	0.4869															
126	-0.0044	0.0352	0.1356	0.0306	0.1830	0.3374	0.4896															
127	-0.0052	0.0354	0.1348	0.0302	0.1828	0.3381	0.4907															
128	-0.0040	0.0342	0.1360	0.0302	0.1822	0.3362	0.4883															
129	-0.0023	0.0336	0.1377	0.0312	0.1824	0.3347	0.4859															
130	-0.0009	0.0329	0.1391	0.0319	0.1824	0.3334	0.4838															
131	-0.0022	0.0340	0.1378	0.0319	0.1830	0.3351	0.4862															
132	-0.0030	0.0345	0.1370	0.0314	0.1829	0.3360	0.4875															
133	-0.0018	0.0351	0.1382	0.0333	0.1842	0.3360	0.4868															
134	-0.0013	0.0334	0.1387	0.0320	0.1827	0.3341	0.4847															
135	-0.0011	0.0335	0.1389	0.0324	0.1829	0.3340	0.4845															
136	-0.0002	0.0329	0.1398	0.0328	0.1829	0.3330	0.4831															
137	-0.0012	0.0334	0.1388	0.0322	0.1828	0.3340	0.4846															
138	0.0005	0.0329	0.1405	0.0334	0.1831	0.3326	0.4823															
139	0.0013	0.0315	0.1413	0.0328	0.1821	0.3306	0.4801															
140	-0.0007	0.0335	0.1393	0.0329	0.1832	0.3339	0.4842															
141	0.0010	0.0314	0.1410	0.0324	0.1819	0.3309	0.4804															
142	0.0020	0.0336	0.1420	0.0358	0.1848	0.3326	0.4816															
143	0.0009	0.0337	0.1409	0.0347	0.1842	0.3333	0.4828															
144	0.0006	0.0347	0.1406	0.0354	0.1850	0.3344	0.4841															
145	0.0030	0.0321	0.1430	0.0351	0.1836	0.3306	0.4791															
146	0.0014	0.0333	0.1414	0.0348	0.1840	0.3326	0.4819															
147	0.0022	0.0339	0.1422	0.0361	0.1850	0.3327	0.4816															
148	0.0045	0.0313	0.1445	0.0358	0.1836	0.3291	0.4769															
149	0.0055	0.0318	0.1455	0.0374	0.1846	0.3291	0.4763															
150	0.0049	0.0329	0.1449	0.0378	0.1854	0.3305	0.4780															
151	0.0065	0.0317	0.1465	0.0382	0.1850	0.3284	0.4752															
152	0.0072	0.0314	0.1472	0.0386	0.1850	0.3278	0.4743															
153	0.0065	0.0330	0.1465	0.0395	0.1862	0.3297	0.4765															
154	0.0091	0.0314	0.1491	0.0404	0.1859	0.3269	0.4723															
155	0.0088	0.0314	0.1488	0.0402	0.1858	0.3270	0.4726															
156	0.0090	0.0320	0.1490	0.0410	0.1865	0.3275	0.4730															
157	0.0098	0.0312	0.1498	0.0410	0.1861	0.3263	0.4716															
158	0.0117	0.0312	0.1517	0.0429	0.1870	0.3253	0.4695															
159	0.0125	0.0315	0.1525	0.0439	0.1877	0.3252	0.4690															
160	0.0132	0.0312	0.1532	0.0445	0.1878	0.3246	0.4680															
161	0.0133	0.0315	0.1533	0.0448	0.1882	0.3249	0.4683															
162	0.0149	0.0318	0.1549	0.0466	0.1892	0.3243	0.4669															
163	0.0166	0.0306	0.1566	0.0472	0.1889	0.3223	0.4639															
164	0.0168	0.0301	0.1568	0.0470	0.1886	0.3217	0.4633															
165	0.0184	0.0301	0.1584	0.0485	0.1893	0.3206	0.4616															
166	0.0192	0.0300	0.1592	0.0492	0.1896	0.3204	0.4609															
167	0.0211	0.0297	0.1611	0.0508	0.1903	0.3192	0.4586															
168	0.0218	0.0294	0.1618	0.0513	0.1903	0.3185	0.4576															
169	0.0241	0.0288	0.1641	0.0529	0.1906	0.3167	0.4546															
170	0.0251	0.0280	0.1651	0.0531	0.1906	0.3156	0.4530															
171	0.0254	0.0279	0.1654	0.0534	0.1907	0.3152	0.4525															
172	0.0273	0.0282	0.1673	0.0556	0.1919	0.3146	0.4509															
173	0.0284	0.0263	0.1684	0.0547	0.1905	0.3122	0.4480															
174	0.0306	0.0271	0.1706	0.0577	0.1924	0.3119	0.4456															
175	0.0316	0.0258	0.1716	0.0572	0.1914	0.3099	0.4441															
176	0.0321	0.0258	0.1721	0.0577	0.1917	0.3096	0.4436															
177	0.0345	0.0254	0.1745	0.0599	0.1926	0.3081	0.4406															
178	0.0344	0.0253	0.1744	0.0597	0.1925	0.3081	0.4409															
179	0.0381	0.0252	0.1781	0.0633	0.1942	0.3061	0.4371															
180	0.0377	0.0241	0.1777	0.0618	0.1930	0.3053	0.4365															
181	0.0398	0.0226	0.1798	0.0623	0.1925	0.3027	0.4326															
182	0.0412	0.0225	0.1812	0.0636	0.1930	0.3019	0.4313															
183	0.0424	0.0213	0.1824	0.0637	0.1925	0.3001	0.4289															
184	0.0433	0.0215	0.1833	0.0648	0.1932	0.2999	0.4282															
185	0.0450	0.0204	0.1850	0.0654	0.1929	0.2980	0.4255															
186	0.0462	0.0200	0.1862	0.0662	0.1931	0.2969	0.4238															
187	0.0468	0.0186	0.1868	0.0654	0.1920	0.2952	0.4218															
188	0.0487	0.0185	0.1887	0.0672	0.1929	0.2942	0.4199															
189	0.0493	0.0189	0.1893	0.0681	0.1935	0.2942	0.4196															
190	0.0507	0.0174	0.1907	0.0681	0.1927	0.2920	0.4168															
191	0.0517	0.0158	0.1917	0.0675	0.1918	0.2899	0.4141															
192	0.0532	0.0149	0.1932	0.0681	0.1915	0.2883	0.4117															
193	0.0544	0.0149	0.1944	0.0693	0.1921	0.2877	0.4105															
194	0.0554	0.0137	0.1954	0.0691	0.1914	0.2860	0.4084															
195	0.0566	0.0136	0.1966	0.0701	0.1918	0.2853	0.4070															
196	0.0574	0.0113	0.1974	0.0687	0.1900	0.2826	0.4039															
197	0.0583	0.0130	0.1983	0.0713	0.1921	0.2838	0.4046															
198	0.0600	0.0120	0.2000	0.0720	0.1920	0.2820	0.4020															
199	0.0607	0.0106	0.2007	0.0712	0.1909	0.2802	0.3999															
200	0.0616	0.0091	0.2016	0.0706	0.1899	0.2783	0.3975															
201	0.0619	0.0066	0.2019	0.0684	0.1875	0.2756	0.3947															
202	0.0638	0.0075	0.2038	0.0712	0.1893	0.2756	0.3937															
203	0.0639	0.0072	0.2039	0.0711	0.1892	0.2752	0.3932															
204	0.0650	0.0056	0.2050	0.0706	0.1881	0.2731	0.3906															
205	0.0662	0.0050	0.2062	0.0711	0.1881	0.2719	0.3888															
206	0.0661	0.0040	0.2061	0.0700	0.1870	0.2710	0.3879															
207	0.0675	0.0030	0.2075	0.0705	0.1866	0.2692	0.3855															
208	0.0673	0.0012	0.2073	0.0684	0.1848	0.2675	0.3839															
209	0.0679	0.0002	0.2079	0.0680	0.1841	0.2662	0.3823															
210	0.0686	0.0007	0.2086	0.0693	0.1850	0.2664	0.3821															
211	0.0692	-0.0007	0.2092	0.0685	0.1839	0.2647	0.3801															
212	0.0699	-0.0022	0.2099	0.0677	0.1827	0.2628	0.3779															
213	0.0699	-0.0026	0.2099	0.0673	0.1823	0.2624	0.3774															
214	0.0703	-0.0042	0.2103	0.0661	0.1809	0.2607	0.3755															
215	0.0702	-0.0045	0.2102	0.0657	0.1806	0.2604	0.3753															
216	0.0713	-0.0054	0.2113	0.0659	0.1803	0.2590	0.3734															
217	0.0723	-0.0062	0.2123	0.0660	0.1799	0.2576	0.3715															
218	0.0710	-0.0076	0.2110	0.0635	0.1780	0.2569	0.3714															
219	0.0713	-0.0074	0.2113	0.0639	0.1782	0.2570	0.3713															
220	0.0706	-0.0099	0.2106	0.0609	0.1755	0.2547	0.3693															
221	0.0715	-0.0099	0.2115	0.0618	0.1758	0.2543	0.3686															
222	0.0706	-0.0107	0.2106	0.0597	0.1745	0.2540	0.3688															
223	0.0706	-0.0117	0.2106	0.0590	0.1736	0.2530	0.3677															
224	0.0699	-0.0122	0.2099	0.0577	0.1728	0.2529	0.3679															
225	0.0697	-0.0124	0.2097	0.0573	0.1724	0.2527	0.3679															
226	0.0693	-0.0135	0.2093	0.0568	0.1711	0.2518	0.3672															

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
227	0.0686	-0.0143	0.2088	0.0543	0.1700	0.2514	0.3671															
228	0.0679	-0.0149	0.2079	0.0530	0.1690	0.2511	0.3672															
229	0.0662	-0.0158	0.2062	0.0507	0.1678	0.2513	0.3682															
230	0.0652	-0.0166	0.2052	0.0486	0.1660	0.2506	0.3682															
231	0.0645	-0.0157	0.2045	0.0488	0.1665	0.2521	0.3696															
232	0.0641	-0.0164	0.2041	0.0477	0.1656	0.2515	0.3694															
233	0.0627	-0.0173	0.2027	0.0454	0.1640	0.2513	0.3700															
234	0.0610	-0.0172	0.2010	0.0437	0.1633	0.2523	0.3718															
235	0.0594	-0.0187	0.1994	0.0407	0.1610	0.2518	0.3720															
236	0.0584	-0.0179	0.1984	0.0404	0.1613	0.2529	0.3737															
237	0.0379	-0.0123	0.1779	0.0256	0.1566	0.2687	0.3997															
238	0.0363	-0.0110	0.1763	0.0252	0.1571	0.2708	0.4027															
239	0.0348	-0.0101	0.1748	0.0247	0.1573	0.2725	0.4051															
240	0.0332	-0.0089	0.1732	0.0243	0.1577	0.2745	0.4080															
241	0.0313	-0.0081	0.1713	0.0232	0.1575	0.2763	0.4106															
242	0.0299	-0.0064	0.1699	0.0235	0.1586	0.2787	0.4137															
243	0.0282	-0.0058	0.1682	0.0224	0.1583	0.2801	0.4159															
244	0.0270	-0.0043	0.1670	0.0226	0.1591	0.2822	0.4187															
245	0.0253	-0.0036	0.1653	0.0217	0.1590	0.2837	0.4210															
246	0.0244	-0.0020	0.1644	0.0223	0.1601	0.2858	0.4238															
247	0.0223	-0.0016	0.1623	0.0208	0.1596	0.2873	0.4261															
248	0.0212	-0.0002	0.1612	0.0210	0.1604	0.2891	0.4285															
249	0.0200	0.0011	0.1600	0.0212	0.1612	0.2911	0.4311															
250	0.0187	0.0022	0.1587	0.0209	0.1615	0.2928	0.4334															
251	0.0172	0.0030	0.1572	0.0203	0.1618	0.2944	0.4358															
252	0.0162	0.0039	0.1562	0.0201	0.1620	0.2958	0.4377															
253	0.0155	0.0054	0.1555	0.0209	0.1631	0.2978	0.4398															
254	0.0140	0.0063	0.1540	0.0203	0.1633	0.2993	0.4423															
255	0.0133	0.0073	0.1533	0.0206	0.1640	0.3007	0.4441															
256	0.0122	0.0081	0.1522	0.0203	0.1642	0.3020	0.4459															
257	0.0110	0.0092	0.1510	0.0202	0.1647	0.3037	0.4482															
258	0.0101	0.0099	0.1501	0.0200	0.1650	0.3049	0.4498															
259	0.0092	0.0106	0.1492	0.0200	0.1654	0.3062	0.4516															
260	0.0085	0.0113	0.1485	0.0198	0.1656	0.3071	0.4529															
261	0.0076	0.0129	0.1476	0.0206	0.1667	0.3091	0.4553															
262	0.0066	0.0132	0.1466	0.0196	0.1665	0.3099	0.4565															
263	0.0058	0.0140	0.1458	0.0198	0.1669	0.3111	0.4582															
264	0.0052	0.0150	0.1452	0.0202	0.1678	0.3123	0.4597															
265	0.0044	0.0155	0.1444	0.0200	0.1677	0.3133	0.4611															
266	0.0035	0.0161	0.1435	0.0196	0.1679	0.3144	0.4626															
267	0.0030	0.0165	0.1430	0.0195	0.1680	0.3150	0.4635															
268	0.0022	0.0175	0.1422	0.0198	0.1685	0.3164	0.4653															
269	0.0014	0.0178	0.1414	0.0192	0.1685	0.3171	0.4664															
270	0.0007	0.0184	0.1407	0.0191	0.1687	0.3180	0.4677															
271	0.0004	0.0188	0.1404	0.0191	0.1689	0.3188	0.4684															
272	-0.0003	0.0194	0.1397	0.0191	0.1692	0.3196	0.4697															
273	-0.0012	0.0196	0.1388	0.0184	0.1690	0.3202	0.4706															
274	-0.0015	0.0203	0.1385	0.0188	0.1695	0.3211	0.4718															
275	-0.0024	0.0206	0.1376	0.0184	0.1696	0.3219	0.4731															
276	-0.0030	0.0210	0.1370	0.0180	0.1695	0.3225	0.4740															
277	-0.0032	0.0219	0.1368	0.0187	0.1703	0.3235	0.4750															
278	-0.0043	0.0219	0.1357	0.0177	0.1698	0.3240	0.4762															
279	-0.0044	0.0225	0.1356	0.0181	0.1703	0.3246	0.4768															
280	-0.0050	0.0228	0.1350	0.0178	0.1703	0.3253	0.4778															
281	-0.0053	0.0232	0.1347	0.0179	0.1706	0.3259	0.4785															
282	-0.0060	0.0235	0.1340	0.0175	0.1705	0.3265	0.4794															
283	-0.0064	0.0237	0.1336	0.0173	0.1705	0.3269	0.4801															
284	-0.0071	0.0238	0.1329	0.0166	0.1702	0.3273	0.4809															
285	-0.0074	0.0243	0.1326	0.0169	0.1706	0.3280	0.4818															
286	-0.0077	0.0247	0.1323	0.0169	0.1706	0.3285	0.4824															
287	-0.0082	0.0249	0.1318	0.0167	0.1706	0.3290	0.4831															
288	-0.0084	0.0253	0.1316	0.0170	0.1712	0.3295	0.4837															
289	-0.0088	0.0253	0.1312	0.0165	0.1709	0.3297	0.4841															
290	-0.0093	0.0258	0.1307	0.0165	0.1712	0.3304	0.4851															
291	-0.0097	0.0262	0.1303	0.0165	0.1713	0.3311	0.4859															
292	-0.0100	0.0261	0.1300	0.0161	0.1711	0.3311	0.4861															
293	-0.0102	0.0267	0.1298	0.0165	0.1716	0.3318	0.4870															
294	-0.0109	0.0267	0.1291	0.0158	0.1713	0.3321	0.4876															
295	-0.0112	0.0269	0.1288	0.0156	0.1713	0.3325	0.4881															
296	-0.0112	0.0271	0.1288	0.0159	0.1715	0.3327	0.4883															
297	-0.0118	0.0274	0.1282	0.0156	0.1715	0.3333	0.4892															
298	-0.0120	0.0276	0.1280	0.0156	0.1716	0.3336	0.4895															
299	-0.0123	0.0277	0.1277	0.0154	0.1715	0.3338	0.4900															
300	-0.0126	0.0281	0.1274	0.0154	0.1717	0.3344	0.4907															
301	-0.0128	0.0282	0.1272	0.0153	0.1718	0.3348	0.4910															
302	-0.0132	0.0284	0.1268	0.0152	0.1718	0.3350	0.4916															
303	-0.0134	0.0285	0.1266	0.0151	0.1718	0.3352	0.4919															
304	-0.0136	0.0286	0.1264	0.0150	0.1718	0.3354	0.4922															
305	-0.0139	0.0287	0.1261	0.0147	0.1717	0.3358	0.4926															
306	-0.0142	0.0291	0.1258	0.0149	0.1720	0.3362	0.4933															
307	-0.0144	0.0292	0.1256	0.0148	0.1720	0.3364	0.4936															
308	-0.0149	0.0293	0.1251	0.0144	0.1719	0.3367	0.4942															
309	-0.0149	0.0293	0.1251	0.0144	0.1718	0.3367	0.4942															
310	-0.0153	0.0295	0.1247	0.0142	0.1719	0.3371	0.4948															
311	-0.0154	0.0295	0.1246	0.0141	0.1718	0.3372	0.4950															
312	-0.0157	0.0297	0.1243	0.0140	0.1718	0.3375	0.4953															
313	-0.0160	0.0298	0.1240	0.0138	0.1718	0.3378	0.4958															
314	-0.0161	0.0299	0.1239	0.0138	0.1718	0.3380	0.4961															
315	-0.0167	0.0300	0.1233	0.0133	0.1717	0.3383	0.4967															
316	-0.0167	0.0302	0.1233	0.0134	0.1718	0.3385	0.4969															
317	-0.0170	0.0301	0.1230	0.0131	0.1718	0.3386	0.4972															
318	-0.0172	0.0302	0.1228	0.0130	0.1718	0.3388	0.4974															
319	-0.0175	0.0304	0.1225	0.0129	0.1716	0.3392	0.4979															
320	-0.0178	0.0304	0.1222	0.0126	0.1715	0.3393	0.4983															
321	-0.0179	0.0304	0.1221	0.0126	0.1715	0.3394	0.4983															
322	-0.0183	0.0305	0.1217	0.0122	0.1713	0.3396	0.4987															
323	-0.0185	0.0305	0.1215	0.0121	0.1713	0.3398	0.4990															
324	-0.0186	0.0305	0.1214	0.0119	0.1712	0.3398	0.4991															
325	-0.0188	0.0305	0.1212	0.0116	0.1710	0.3399	0.4993															
326	-0.0192	0.0306	0.1208	0.0116	0.1712	0.3404	0.5000															
327	-0.0195	0.0306	0.1205	0.0111	0.1706	0.3403	0.5001															
328	-0.0196	0.0306	0.1204	0.0111	0.1706	0.3404	0.5002															
329	-0.0200	0.0307	0.1200	0.0107	0.1707	0.3407	0.5007															
330	-0.0201	0.0309	0.1199	0.0108	0.1706	0.3410	0.5010															
331	-0.0204	0.0308	0.1196	0.0104	0.1706	0.3410	0.5012															
332	-0.0207	0.0307	0.1193	0.0101	0.1704	0.3411	0.5014															
333	-0.0210	0.0308	0.1190	0.0098	0.1703	0.3413	0.5016															
334	-0.0212	0.0306	0.1188	0.0094	0.1700	0.3412	0.5018															
335	-0.0215	0.0307	0.1185	0.0092	0.1700	0.3414	0.5022															
336	-0.0217	0.0306	0.1183	0.0090	0.1699	0.3417	0.5025															
337	-0.0218	0.0307	0.1182	0.0089	0.1698	0.3416	0.5025															
338	-0.0222	0.0308	0.1178	0.0084	0.1695	0.3417	0.5028															
339	-0.0225	0.0307	0.1175	0.0082	0.1695	0.3420	0.5032															

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
340	-0.0226	0.0306	0.1174	0.0080	0.1693	0.3420	0.5033															
341	-0.0229	0.0307	0.1171	0.0078	0.1692	0.3421	0.5036															
342	-0.0233	0.0306	0.1167	0.0073	0.1690	0.3422	0.5039															
343	-0.0235	0.0306	0.1165	0.0071	0.1688	0.3423	0.5041															
344	-0.0239	0.0305	0.1161	0.0067	0.1686	0.3424	0.5044															
345	-0.0241	0.0305	0.1159	0.0064	0.1685	0.3426	0.5047															
346	-0.0243	0.0306	0.1157	0.0064	0.1685	0.3427	0.5049															
347	-0.0244	0.0307	0.1156	0.0062	0.1685	0.3429	0.5051															
348	-0.0247	0.0305	0.1153	0.0058	0.1681	0.3428	0.5052															
349	-0.0249	0.0306	0.1151	0.0057	0.1682	0.3431	0.5055															
350	-0.0252	0.0304	0.1148	0.0052	0.1678	0.3430	0.5056															
351	-0.0255	0.0305	0.1145	0.0050	0.1677	0.3432	0.5059															
352	-0.0258	0.0305	0.1145	0.0050	0.1678	0.3433	0.5061															
353	-0.0260	0.0304	0.1140	0.0044	0.1674	0.3434	0.5064															
354	-0.0261	0.0304	0.1139	0.0043	0.1674	0.3435	0.5066															
355	-0.0264	0.0302	0.1136	0.0038	0.1670	0.3434	0.5066															
356	-0.0266	0.0303	0.1134	0.0037	0.1670	0.3436	0.5069															
357	-0.0269	0.0303	0.1131	0.0034	0.1669	0.3438	0.5072															
358	-0.0270	0.0302	0.1130	0.0031	0.1667	0.3437	0.5072															
359	-0.0273	0.0302	0.1127	0.0029	0.1665	0.3438	0.5074															
360	-0.0275	0.0302	0.1125	0.0027	0.1665	0.3439	0.5076															
361	-0.0277	0.0301	0.1123	0.0024	0.1662	0.3439	0.5077															
362	-0.0280	0.0301	0.1120	0.0021	0.1661	0.3441	0.5081															
363	-0.0280	0.0301	0.1120	0.0020	0.1660	0.3441	0.5081															
364	-0.0283	0.0300	0.1117	0.0017	0.1659	0.3441	0.5083															
365	-0.0285	0.0300	0.1116	0.0015	0.1658	0.3442	0.5084															
366	-0.0288	0.0299	0.1112	0.0012	0.1655	0.3443	0.5087															
367	-0.0290	0.0299	0.1110	0.0010	0.1654	0.3444	0.5089															
368	-0.0292	0.0298	0.1108	0.0006	0.1652	0.3444	0.5090															
369	-0.0293	0.0298	0.1107	0.0005	0.1652	0.3445	0.5092															
370	-0.0297	0.0298	0.1103	0.0002	0.1650	0.3446	0.5095															
371	-0.0298	0.0297	0.1102	-0.0001	0.1648	0.3448	0.5095															
372	-0.0299	0.0297	0.1101	-0.0002	0.1647	0.3446	0.5095															
373	-0.0303	0.0296	0.1097	-0.0007	0.1644	0.3447	0.5098															
374	-0.0303	0.0296	0.1097	-0.0007	0.1645	0.3448	0.5100															
375	-0.0306	0.0295	0.1094	-0.0010	0.1642	0.3448	0.5101															
376	-0.0307	0.0296	0.1093	-0.0010	0.1643	0.3450	0.5103															
377	-0.0310	0.0296	0.1090	-0.0014	0.1641	0.3450	0.5105															
378	-0.0312	0.0294	0.1088	-0.0017	0.1639	0.3450	0.5106															
379	-0.0313	0.0294	0.1087	-0.0019	0.1637	0.3450	0.5107															
380	-0.0315	0.0294	0.1065	-0.0021	0.1636	0.3451	0.5109															
381	-0.0319	0.0293	0.1061	-0.0025	0.1634	0.3453	0.5112															
382	-0.0318	0.0292	0.1062	-0.0026	0.1633	0.3452	0.5111															
383	-0.0322	0.0294	0.1078	-0.0028	0.1633	0.3455	0.5116															
384	-0.0323	0.0294	0.1077	-0.0030	0.1632	0.3455	0.5117															
385	-0.0326	0.0293	0.1074	-0.0033	0.1630	0.3455	0.5118															
386	-0.0328	0.0293	0.1072	-0.0035	0.1629	0.3457	0.5121															
387	-0.0330	0.0294	0.1070	-0.0038	0.1629	0.3459	0.5124															
388	-0.0333	0.0293	0.1067	-0.0040	0.1626	0.3459	0.5126															
389	-0.0333	0.0292	0.1067	-0.0040	0.1626	0.3459	0.5125															
390	-0.0336	0.0294	0.1064	-0.0042	0.1626	0.3462	0.5130															
391	-0.0338	0.0292	0.1062	-0.0046	0.1623	0.3461	0.5130															
392	-0.0339	0.0294	0.1061	-0.0045	0.1624	0.3464	0.5133															
393	-0.0342	0.0294	0.1058	-0.0048	0.1623	0.3464	0.5135															
394	-0.0344	0.0293	0.1058	-0.0051	0.1621	0.3465	0.5137															
395	-0.0346	0.0295	0.1054	-0.0051	0.1622	0.3468	0.5140															
396	-0.0348	0.0294	0.1052	-0.0053	0.1620	0.3468	0.5142															
397	-0.0351	0.0295	0.1049	-0.0055	0.1620	0.3470	0.5146															
398	-0.0352	0.0295	0.1048	-0.0058	0.1618	0.3471	0.5147															
399	-0.0354	0.0296	0.1046	-0.0058	0.1619	0.3473	0.5150															
400	-0.0358	0.0296	0.1042	-0.0061	0.1617	0.3475	0.5154															
401	-0.0359	0.0296	0.1041	-0.0061	0.1618	0.3477	0.5156															
402	-0.0362	0.0297	0.1038	-0.0065	0.1616	0.3478	0.5159															
403	-0.0365	0.0300	0.1035	-0.0065	0.1617	0.3482	0.5164															
404	-0.0367	0.0299	0.1033	-0.0069	0.1615	0.3482	0.5166															
405	-0.0370	0.0300	0.1030	-0.0070	0.1615	0.3485	0.5170															
406	-0.0372	0.0301	0.1028	-0.0071	0.1615	0.3487	0.5173															
407	-0.0374	0.0302	0.1026	-0.0072	0.1615	0.3488	0.5175															
408	-0.0377	0.0302	0.1023	-0.0074	0.1614	0.3491	0.5179															
409	-0.0379	0.0303	0.1021	-0.0075	0.1614	0.3493	0.5182															
410	-0.0380	0.0304	0.1020	-0.0077	0.1614	0.3494	0.5184															
411	-0.0381	0.0304	0.1019	-0.0077	0.1614	0.3495	0.5185															
412	-0.0381	0.0305	0.1019	-0.0075	0.1615	0.3496	0.5186															
413	-0.0381	0.0305	0.1019	-0.0076	0.1615	0.3496	0.5186															
414	-0.0380	0.0307	0.1020	-0.0073	0.1617	0.3496	0.5186															
415	-0.0378	0.0307	0.1022	-0.0072	0.1618	0.3496	0.5185															
416	-0.0377	0.0306	0.1023	-0.0071	0.1618	0.3496	0.5183															
417	-0.0375	0.0307	0.1025	-0.0068	0.1619	0.3495	0.5182															
418	-0.0372	0.0307	0.1028	-0.0066	0.1620	0.3493	0.5179															
419	-0.0371	0.0307	0.1029	-0.0064	0.1621	0.3492	0.5178															
420	-0.0369	0.0308	0.1031	-0.0064	0.1621	0.3490	0.5175															
421	-0.0367	0.0306	0.1033	-0.0061	0.1622	0.3489	0.5173															
422	-0.0365	0.0306	0.1035	-0.0059	0.1623	0.3488	0.5170															
423	-0.0361	0.0305	0.1039	-0.0056	0.1625	0.3486	0.5167															
424	-0.0358	0.0306	0.1042	-0.0053	0.1626	0.3485	0.5164															
425	-0.0356	0.0305	0.1044	-0.0051	0.1627	0.3482	0.5160															
426	-0.0353	0.0305	0.1047	-0.0049	0.1628	0.3481	0.5158															
427	-0.0350	0.0304	0.1050	-0.0046	0.1629	0.3480	0.5155															
428	-0.0349	0.0304	0.1051	-0.0045	0.1629	0.3478	0.5153															
429	-0.0347	0.0304	0.1053	-0.0042	0.1631	0.3478	0.5151															
430	-0.0344	0.0304	0.1056	-0.0041	0.1632	0.3476	0.5148															
431	-0.0342	0.0305	0.1058	-0.0036	0.1635	0.3476	0.5147															
432	-0.0341	0.0304	0.1059	-0.0036	0.1634	0.3475	0.5145															
433	-0.0339	0.0306	0.1061	-0.0033	0.1636	0.3478	0.5145															
434	-0.0338	0.0306	0.1062	-0.0031	0.1637	0.3475	0.5144															
435	-0.0337	0.0306	0.1063	-0.0029	0.1640	0.3478	0.5145															
436	-0.0334	0.0306	0.1066	-0.0025	0.1641	0.3475	0.5142															
437	-0.0332	0.0310	0.1068	-0.0023	0.1643	0.3476	0.5142															
438	-0.0330	0.0311	0.1070	-0.0019	0.1646	0.3476	0.5141															
439	-0.0329	0.0312	0.1071	-0.0017	0.1647	0.3476	0.5141															
440	-0.0326	0.0313	0.1074	-0.0014	0.1650	0.3476	0.5139															
441	-0.0325	0.0314	0.1075	-0.0011	0.1652	0.3476	0.5139															
442	-0.0323	0.0315	0.1077	-0.0008	0.1654	0.3477	0.5139															
443	-0.0322	0.0316	0.1079	-0.0004	0.1657	0.3478	0.5139															
444	-0.0319	0.0317	0.1081	-0.0001	0.1658	0.3477	0.5136															
445	-0.0318	0.0320	0.1082	0.0002	0.1661	0.3478	0.5137															
446	-0.0315	0.0321	0.1085	0.0006	0.1664	0.3479	0.5137															
447	-0.0314	0.0321	0.1086	0.0007	0.1664	0.3479	0.5136															
448	-0.0312	0.0324	0.1088	0.0012	0.1668	0.3480	0.5136															
449	-0.0311	0.0325	0.1089	0.0014	0.1669	0.3480	0.5136															
450	-0.0309	0.0325	0.1091	0.0017	0.1671	0.3480	0.5134															
451	-0.0308	0.0328	0.1092	0.0020	0.1674	0.3482	0.5136															
452	-0.0305	0.0329	0.1095	0.0024	0.1677	0.3481	0.5134															

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
453	-0.0303	0.0330	0.1097	0.0028	0.1679	0.3481	0.5133															
454	-0.0301	0.0332	0.1099	0.0031	0.1681	0.3483	0.5133															
455	-0.0300	0.0333	0.1100	0.0034	0.1684	0.3483	0.5133															
456	-0.0298	0.0335	0.1102	0.0037	0.1686	0.3484	0.5133															
457	-0.0296	0.0337	0.1104	0.0041	0.1689	0.3485	0.5133															
458	-0.0295	0.0338	0.1105	0.0043	0.1690	0.3485	0.5133															
459	-0.0293	0.0340	0.1107	0.0047	0.1693	0.3486	0.5133															
460	-0.0291	0.0341	0.1109	0.0050	0.1695	0.3487	0.5133															
461	-0.0289	0.0343	0.1111	0.0054	0.1699	0.3487	0.5132															
462	-0.0287	0.0344	0.1113	0.0057	0.1701	0.3488	0.5131															
463	-0.0285	0.0346	0.1115	0.0061	0.1704	0.3489	0.5131															
464	-0.0284	0.0347	0.1116	0.0064	0.1705	0.3489	0.5131															
465	-0.0281	0.0349	0.1119	0.0068	0.1709	0.3490	0.5131															
466	-0.0280	0.0351	0.1120	0.0071	0.1711	0.3491	0.5130															
467	-0.0278	0.0352	0.1122	0.0074	0.1713	0.3491	0.5130															
468	-0.0275	0.0354	0.1125	0.0079	0.1717	0.3492	0.5130															
469	-0.0275	0.0356	0.1125	0.0081	0.1719	0.3493	0.5131															
470	-0.0271	0.0358	0.1129	0.0086	0.1722	0.3493	0.5129															
471	-0.0269	0.0359	0.1131	0.0090	0.1724	0.3493	0.5128															
472	-0.0267	0.0361	0.1133	0.0094	0.1727	0.3494	0.5127															
473	-0.0265	0.0362	0.1135	0.0097	0.1729	0.3495	0.5128															
474	-0.0262	0.0363	0.1138	0.0101	0.1732	0.3495	0.5126															
475	-0.0260	0.0366	0.1140	0.0106	0.1736	0.3495	0.5125															
476	-0.0258	0.0367	0.1142	0.0109	0.1738	0.3496	0.5124															
477	-0.0256	0.0368	0.1144	0.0112	0.1740	0.3496	0.5124															
478	-0.0253	0.0370	0.1147	0.0117	0.1744	0.3496	0.5123															
479	-0.0250	0.0370	0.1150	0.0120	0.1745	0.3495	0.5120															
480	-0.0249	0.0370	0.1151	0.0121	0.1745	0.3494	0.5119															
481	-0.0247	0.0374	0.1154	0.0127	0.1751	0.3497	0.5120															
482	-0.0243	0.0376	0.1157	0.0132	0.1754	0.3497	0.5119															
483	-0.0241	0.0377	0.1159	0.0136	0.1757	0.3498	0.5118															
484	-0.0238	0.0380	0.1162	0.0142	0.1761	0.3499	0.5118															
485	-0.0235	0.0381	0.1165	0.0145	0.1763	0.3498	0.5116															
486	-0.0234	0.0382	0.1166	0.0146	0.1765	0.3499	0.5116															
487	-0.0229	0.0384	0.1171	0.0154	0.1769	0.3498	0.5113															
488	-0.0227	0.0385	0.1173	0.0156	0.1772	0.3499	0.5112															
489	-0.0225	0.0387	0.1175	0.0163	0.1775	0.3500	0.5112															
490	-0.0221	0.0388	0.1179	0.0167	0.1778	0.3499	0.5110															
491	-0.0219	0.0390	0.1181	0.0170	0.1780	0.3500	0.5109															
492	-0.0216	0.0391	0.1184	0.0176	0.1784	0.3499	0.5107															
493	-0.0214	0.0392	0.1186	0.0179	0.1786	0.3499	0.5106															
494	-0.0210	0.0394	0.1190	0.0185	0.1789	0.3499	0.5104															
495	-0.0207	0.0396	0.1193	0.0190	0.1793	0.3499	0.5103															
496	-0.0203	0.0397	0.1197	0.0194	0.1796	0.3499	0.5101															
497	-0.0201	0.0399	0.1199	0.0198	0.1799	0.3499	0.5100															
498	-0.0198	0.0400	0.1202	0.0203	0.1802	0.3499	0.5098															
499	-0.0195	0.0402	0.1205	0.0208	0.1804	0.3500	0.5097															
500	-0.0192	0.0404	0.1208	0.0213	0.1806	0.3500	0.5096															
501	-0.0188	0.0405	0.1212	0.0218	0.1811	0.3499	0.5093															
502	-0.0186	0.0407	0.1215	0.0222	0.1815	0.3500	0.5093															
503	-0.0182	0.0408	0.1218	0.0226	0.1817	0.3499	0.5089															
504	-0.0178	0.0410	0.1222	0.0231	0.1820	0.3499	0.5088															
505	-0.0174	0.0412	0.1226	0.0238	0.1825	0.3499	0.5086															
506	-0.0170	0.0413	0.1230	0.0242	0.1828	0.3498	0.5083															
507	-0.0167	0.0415	0.1233	0.0248	0.1831	0.3498	0.5082															
508	-0.0164	0.0416	0.1236	0.0252	0.1834	0.3498	0.5080															
509	-0.0160	0.0418	0.1240	0.0258	0.1838	0.3498	0.5078															
510	-0.0157	0.0419	0.1244	0.0263	0.1841	0.3497	0.5076															
511	-0.0153	0.0421	0.1247	0.0268	0.1844	0.3498	0.5074															
512	-0.0149	0.0423	0.1251	0.0274	0.1849	0.3498	0.5072															
513	-0.0145	0.0424	0.1255	0.0279	0.1851	0.3497	0.5069															
514	-0.0141	0.0426	0.1259	0.0284	0.1855	0.3498	0.5067															
515	-0.0137	0.0427	0.1263	0.0290	0.1859	0.3496	0.5064															
516	-0.0133	0.0429	0.1267	0.0295	0.1862	0.3495	0.5062															
517	-0.0129	0.0430	0.1271	0.0301	0.1865	0.3495	0.5059															
518	-0.0125	0.0432	0.1275	0.0306	0.1869	0.3495	0.5057															
519	-0.0122	0.0433	0.1278	0.0311	0.1872	0.3494	0.5056															
520	-0.0117	0.0435	0.1283	0.0318	0.1877	0.3494	0.5053															
521	-0.0114	0.0436	0.1286	0.0322	0.1879	0.3493	0.5050															
522	-0.0109	0.0437	0.1291	0.0328	0.1883	0.3492	0.5047															
523	-0.0106	0.0438	0.1294	0.0333	0.1885	0.3491	0.5044															
524	-0.0102	0.0440	0.1298	0.0338	0.1889	0.3491	0.5042															
525	-0.0098	0.0441	0.1302	0.0344	0.1892	0.3490	0.5039															
526	-0.0094	0.0443	0.1306	0.0349	0.1896	0.3489	0.5036															
527	-0.0090	0.0444	0.1310	0.0354	0.1899	0.3489	0.5034															
528	-0.0087	0.0444	0.1313	0.0357	0.1901	0.3488	0.5031															
529	-0.0082	0.0446	0.1318	0.0363	0.1904	0.3487	0.5028															
530	-0.0078	0.0447	0.1322	0.0369	0.1908	0.3486	0.5025															
531	-0.0075	0.0448	0.1325	0.0373	0.1911	0.3486	0.5024															
532	-0.0071	0.0449	0.1329	0.0379	0.1914	0.3484	0.5020															
533	-0.0068	0.0449	0.1332	0.0381	0.1915	0.3483	0.5018															
534	-0.0064	0.0451	0.1336	0.0387	0.1919	0.3483	0.5015															
535	-0.0060	0.0452	0.1340	0.0392	0.1922	0.3482	0.5012															
536	-0.0056	0.0453	0.1344	0.0396	0.1925	0.3481	0.5009															
537	-0.0053	0.0454	0.1347	0.0401	0.1928	0.3480	0.5007															
538	-0.0049	0.0455	0.1351	0.0406	0.1930	0.3479	0.5003															
539	-0.0046	0.0456	0.1354	0.0409	0.1932	0.3479	0.5002															
540	-0.0042	0.0456	0.1358	0.0414	0.1935	0.3477	0.4998															
541	-0.0038	0.0457	0.1362	0.0419	0.1938	0.3476	0.4995															
542	-0.0035	0.0458	0.1365	0.0423	0.1941	0.3475	0.4993															
543	-0.0031	0.0458	0.1369	0.0428	0.1943	0.3474	0.4989															
544	-0.0027	0.0459	0.1373	0.0433	0.1946	0.3472	0.4986															
545	-0.0024	0.0460	0.1376	0.0436	0.1948	0.3472	0.4983															
546	-0.0018	0.0461	0.1382	0.0442	0.1951	0.3470	0.4979															
547	-0.0015	0.0461	0.1385	0.0446	0.1954	0.3469	0.4977															
548	-0.0011	0.0462	0.1389	0.0451	0.1956	0.3468	0.4973															
549	-0.0008	0.0463	0.1392	0.0455	0.1959	0.3467	0.4971															
550	-0.0003	0.0464	0.1397	0.0461	0.1963	0.3466	0.4967															
551	0.0001	0.0464	0.1401	0.0465	0.1964	0.3464	0.4963															
552	0.0005	0.0465	0.1405	0.0471	0.1968	0.3463	0.4960															
553	0.0010	0.0465	0.1410	0.0475	0.1970	0.3460	0.4956															
554	0.0014	0.0467	0.1414	0.0481	0.1974	0.3460	0.4953															
555	0.0018	0.0467	0.1418	0.0485	0.1976	0.3458	0.4949															
556	0.0023	0.0468	0.1423	0.0491	0.1980	0.3456	0.4944															
557	0.0027	0.0468	0.1427	0.0495	0.1982	0.3455	0.4941															
558	0.0032	0.0469	0.1432	0.0501	0.1985	0.3453	0.4937															
559	0.0036	0.0469	0.1436	0.0507	0.1988	0.3451	0.4932															
560	0.0042	0.0469	0.1442	0.0512	0.1991	0.3448	0.4927															
561	0.0047	0.0470	0.1447	0.0517	0.1993	0.3447	0.4923															
562	0.0052	0.0471	0.1452	0.0522	0.1996	0.3445	0.4919															
563	0.0056	0.0471	0.1456	0.0527	0.1999	0.3442	0.4914															
564	0.0061	0.0471	0.1461	0.0533	0.2002	0.3441	0.4910															
565	0.0067	0.0472	0.1467	0.0538	0.2005	0.3438	0.4905															

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
566	0.0072	0.0472	0.1472	0.0543	0.2007	0.3436	0.4900															
567	0.0076	0.0472	0.1476	0.0548	0.2010	0.3434	0.4896															
568	0.0080	0.0472	0.1480	0.0552	0.2012	0.3431	0.4891															
569	0.0085	0.0472	0.1485	0.0557	0.2014	0.3429	0.4886															
570	0.0090	0.0471	0.1490	0.0561	0.2016	0.3426	0.4881															
571	0.0095	0.0471	0.1495	0.0566	0.2018	0.3424	0.4877															
572	0.0099	0.0471	0.1499	0.0570	0.2020	0.3421	0.4872															
573	0.0102	0.0470	0.1502	0.0573	0.2021	0.3419	0.4868															
574	0.0106	0.0470	0.1506	0.0576	0.2023	0.3417	0.4864															
575	0.0111	0.0470	0.1511	0.0580	0.2025	0.3414	0.4859															
576	0.0113	0.0469	0.1513	0.0583	0.2026	0.3413	0.4856															
577	0.0117	0.0468	0.1517	0.0586	0.2027	0.3410	0.4851															
578	0.0120	0.0468	0.1520	0.0585	0.2028	0.3408	0.4848															
579	0.0124	0.0487	0.1524	0.0591	0.2029	0.3405	0.4844															
580	0.0126	0.0487	0.1526	0.0592	0.2029	0.3404	0.4841															
581	0.0129	0.0487	0.1529	0.0596	0.2031	0.3402	0.4838															
582	0.0131	0.0485	0.1531	0.0596	0.2031	0.3400	0.4834															
583	0.0134	0.0485	0.1534	0.0598	0.2031	0.3398	0.4831															
584	0.0135	0.0484	0.1535	0.0599	0.2032	0.3396	0.4829															
585	0.0138	0.0483	0.1538	0.0601	0.2032	0.3395	0.4826															
586	0.0139	0.0483	0.1539	0.0602	0.2032	0.3393	0.4824															
587	0.0142	0.0482	0.1542	0.0604	0.2033	0.3392	0.4821															
588	0.0145	0.0482	0.1545	0.0607	0.2034	0.3390	0.4817															
589	0.0146	0.0462	0.1546	0.0606	0.2035	0.3389	0.4815															
590	0.0148	0.0461	0.1548	0.0609	0.2035	0.3387	0.4813															
591	0.0150	0.0461	0.1550	0.0611	0.2036	0.3386	0.4811															
592	0.0153	0.0460	0.1553	0.0613	0.2037	0.3384	0.4806															
593	0.0156	0.0460	0.1556	0.0616	0.2038	0.3382	0.4804															
594	0.0158	0.0459	0.1558	0.0617	0.2038	0.3380	0.4801															
595	0.0161	0.0460	0.1561	0.0621	0.2040	0.3379	0.4798															
596	0.0164	0.0458	0.1564	0.0622	0.2040	0.3377	0.4795															
597	0.0167	0.0458	0.1567	0.0625	0.2042	0.3375	0.4792															
598	0.0170	0.0458	0.1570	0.0628	0.2043	0.3373	0.4788															
599	0.0245	0.0433	0.1645	0.0678	0.2056	0.3311	0.4688															
600	0.0250	0.0431	0.1650	0.0681	0.2056	0.3306	0.4681															
601	0.0253	0.0429	0.1653	0.0681	0.2055	0.3302	0.4676															
602	0.0258	0.0426	0.1656	0.0682	0.2054	0.3299	0.4671															
603	0.0260	0.0424	0.1660	0.0684	0.2054	0.3295	0.4665															
604	0.0262	0.0422	0.1662	0.0685	0.2054	0.3291	0.4660															
605	0.0266	0.0420	0.1666	0.0686	0.2053	0.3287	0.4654															
606	0.0268	0.0418	0.1668	0.0686	0.2052	0.3284	0.4650															
607	0.0270	0.0416	0.1670	0.0687	0.2051	0.3281	0.4646															
608	0.0272	0.0415	0.1672	0.0687	0.2051	0.3279	0.4642															
609	0.0274	0.0413	0.1674	0.0686	0.2050	0.3276	0.4639															
610	0.0276	0.0412	0.1676	0.0687	0.2050	0.3274	0.4636															
611	0.0276	0.0410	0.1676	0.0688	0.2049	0.3271	0.4632															
612	0.0276	0.0408	0.1676	0.0687	0.2047	0.3269	0.4630															
613	0.0281	0.0408	0.1681	0.0688	0.2048	0.3267	0.4627															
614	0.0283	0.0407	0.1683	0.0690	0.2049	0.3266	0.4625															
615	0.0284	0.0406	0.1684	0.0689	0.2047	0.3264	0.4622															
616	0.0286	0.0404	0.1686	0.0690	0.2047	0.3261	0.4619															
617	0.0288	0.0404	0.1688	0.0692	0.2048	0.3259	0.4615															
618	0.0291	0.0403	0.1691	0.0694	0.2049	0.3256	0.4612															
619	0.0294	0.0402	0.1694	0.0696	0.2049	0.3255	0.4608															
620	0.0297	0.0401	0.1697	0.0698	0.2050	0.3253	0.4604															
621	0.0300	0.0400	0.1700	0.0700	0.2050	0.3249	0.4599															
622	0.0303	0.0398	0.1703	0.0701	0.2050	0.3246	0.4595															
623	0.0306	0.0397	0.1706	0.0702	0.2049	0.3244	0.4591															
624	0.0307	0.0395	0.1707	0.0702	0.2048	0.3241	0.4587															
625	0.0308	0.0391	0.1708	0.0699	0.2045	0.3238	0.4584															
626	0.0304	0.0388	0.1704	0.0692	0.2040	0.3236	0.4584															
627	0.0298	0.0383	0.1698	0.0682	0.2032	0.3234	0.4585															
628	0.0293	0.0379	0.1693	0.0672	0.2026	0.3233	0.4586															
629	0.0287	0.0378	0.1687	0.0663	0.2019	0.3233	0.4589															
630	0.0286	0.0375	0.1686	0.0660	0.2017	0.3232	0.4589															
631	0.0288	0.0376	0.1688	0.0663	0.2019	0.3232	0.4588															
632	0.0298	0.0380	0.1698	0.0677	0.2028	0.3231	0.4582															
633	0.0311	0.0385	0.1711	0.0695	0.2040	0.3229	0.4574															
634	0.0329	0.0391	0.1729	0.0721	0.2056	0.3227	0.4562															
635	0.0352	0.0400	0.1752	0.0752	0.2076	0.3224	0.4548															
636	0.0376	0.0408	0.1776	0.0784	0.2096	0.3220	0.4532															
637	0.0403	0.0416	0.1803	0.0819	0.2116	0.3215	0.4513															
638	0.0428	0.0424	0.1828	0.0852	0.2138	0.3210	0.4496															
639	0.0451	0.0430	0.1851	0.0881	0.2158	0.3204	0.4479															
640	0.0471	0.0435	0.1871	0.0907	0.2171	0.3200	0.4464															
641	0.0490	0.0439	0.1890	0.0929	0.2184	0.3194	0.4449															
642	0.0505	0.0442	0.1905	0.0947	0.2194	0.3189	0.4436															
643	0.0519	0.0444	0.1919	0.0963	0.2203	0.3185	0.4425															
644	0.0531	0.0445	0.1931	0.0977	0.2211	0.3180	0.4414															
645	0.0541	0.0446	0.1941	0.0987	0.2218	0.3176	0.4406															
646	0.0551	0.0447	0.1951	0.0996	0.2223	0.3172	0.4396															
647	0.0560	0.0445	0.1960	0.1007	0.2228	0.3168	0.4388															
648	0.0568	0.0448	0.1968	0.1014	0.2231	0.3165	0.4382															
649	0.0571	0.0448	0.1971	0.1019	0.2233	0.3162	0.4376															
650	0.0578	0.0448	0.1978	0.1025	0.2236	0.3160	0.4372															
651	0.0580	0.0448	0.1980	0.1028	0.2238	0.3158	0.4368															
652	0.0582	0.0448	0.1982	0.1030	0.2239	0.3157	0.4368															
653	0.0584	0.0447	0.1984	0.1031	0.2239	0.3156	0.4364															
654	0.0585	0.0447	0.1985	0.1032	0.2240	0.3155	0.4363															
655	0.0585	0.0447	0.1985	0.1032	0.2239	0.3155	0.4362															
656	0.0585	0.0447	0.1985	0.1032	0.2239	0.3154	0.4362															
657	0.0584	0.0446	0.1984	0.1030	0.2238	0.3154	0.4362															
658	0.0584	0.0445	0.1984	0.1029	0.2237	0.3154	0.4362															
659	0.0583	0.0445	0.1983	0.1028	0.2236	0.3153	0.4361															
660	0.0582	0.0444	0.1982	0.1027	0.2235	0.3153	0.4362															
661	0.0583	0.0443	0.1983	0.1027	0.2235	0.3152	0.4360															
662	0.0583	0.0443	0.1983	0.1026	0.2234	0.3152	0.4360															
663	0.0583	0.0442	0.1983	0.1025	0.2233	0.3151	0.4359															
664	0.0583	0.0441	0.1983	0.1024	0.2232	0.3149	0.4358															
665	0.0583	0.0440	0.1983	0.1023	0.2231	0.3148	0.4357															
666	0.0584	0.0439	0.1984	0.1023	0.2231	0.3147	0.4355															
667	0.0585	0.0438	0.1985	0.1022	0.2230	0.3145	0.4353															
668	0.0585	0.0436	0.1985	0.1022	0.2229	0.3144	0.4351															
669	0.0586	0.0435	0.1986	0.1021	0.2228	0.3142	0.4349															
670	0.0587	0.0434	0.1987	0.1021	0.2227	0.3140	0.4346															
671	0.0588	0.0433	0.1988	0.1021	0.2227	0.3138	0.4344															
672	0.0589	0.0431	0.1989	0.1021	0.2226	0.3136	0.4342															
673	0.0590	0.0430	0.1990	0.1020	0.2225	0.3135	0.4339															
674	0.0592	0.0428	0.1992	0.1020	0.2224	0.3132	0.4336															
675	0.0593	0.0427	0.1993	0.1020	0.2223	0.3130	0.4334															
676	0.0595	0.0425	0.1995	0.1020	0.2223	0.3128	0.4330															
677	0.0595	0.0424	0.1995	0.1019	0.2221	0.3126	0.4328															
678	0.0596	0.0422	0.1996	0.1018	0.2220	0.3123	0.4325															

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
679	0.0597	0.0420	0.1997	0.1017	0.2218	0.3121	0.4323															
680	0.0599	0.0418	0.1999	0.1017	0.2217	0.3119	0.4319															
681	0.0599	0.0416	0.1999	0.1015	0.2215	0.3116	0.4317															
682	0.0600	0.0414	0.2000	0.1014	0.2214	0.3114	0.4314															
683	0.0601	0.0412	0.2001	0.1014	0.2213	0.3112	0.4311															
684	0.0601	0.0410	0.2001	0.1012	0.2211	0.3110	0.4309															
685	0.0602	0.0408	0.2002	0.1010	0.2209	0.3107	0.4306															
686	0.0603	0.0406	0.2003	0.1009	0.2207	0.3105	0.4303															
687	0.0603	0.0404	0.2003	0.1006	0.2205	0.3102	0.4301															
688	0.0603	0.0402	0.2003	0.1005	0.2203	0.3100	0.4299															
689	0.0603	0.0400	0.2003	0.1003	0.2201	0.3098	0.4296															
690	0.0603	0.0397	0.2003	0.1001	0.2199	0.3096	0.4294															
691	0.0603	0.0395	0.2003	0.0999	0.2197	0.3094	0.4292															
692	0.0603	0.0393	0.2003	0.0996	0.2195	0.3091	0.4290															
693	0.0603	0.0391	0.2003	0.0994	0.2192	0.3089	0.4288															
694	0.0602	0.0388	0.2002	0.0990	0.2189	0.3087	0.4286															
695	0.0602	0.0386	0.2002	0.0988	0.2187	0.3085	0.4284															
696	0.0601	0.0384	0.2001	0.0985	0.2184	0.3083	0.4283															
697	0.0600	0.0381	0.2000	0.0982	0.2181	0.3081	0.4281															
698	0.0599	0.0379	0.1999	0.0978	0.2178	0.3079	0.4279															
699	0.0599	0.0376	0.1999	0.0975	0.2176	0.3077	0.4278															
700	0.0597	0.0374	0.1997	0.0971	0.2172	0.3075	0.4277															
701	0.0594	0.0371	0.1994	0.0965	0.2168	0.3074	0.4276															
702	0.0593	0.0368	0.1993	0.0961	0.2165	0.3072	0.4276															
703	0.0591	0.0365	0.1991	0.0956	0.2161	0.3070	0.4275															
704	0.0588	0.0363	0.1988	0.0951	0.2157	0.3069	0.4274															
705	0.0585	0.0359	0.1985	0.0944	0.2152	0.3067	0.4275															
706	0.0582	0.0356	0.1982	0.0938	0.2147	0.3065	0.4274															
707	0.0580	0.0354	0.1980	0.0934	0.2144	0.3064	0.4274															
708	0.0579	0.0352	0.1979	0.0930	0.2141	0.3062	0.4273															
709	0.0575	0.0349	0.1975	0.0924	0.2136	0.3061	0.4274															
710	0.0572	0.0346	0.1972	0.0917	0.2131	0.3060	0.4274															
711	0.0568	0.0342	0.1968	0.0910	0.2126	0.3058	0.4274															
712	0.0564	0.0339	0.1964	0.0903	0.2121	0.3057	0.4275															
713	0.0560	0.0336	0.1960	0.0896	0.2116	0.3056	0.4276															
714	0.0556	0.0333	0.1956	0.0889	0.2111	0.3055	0.4277															
715	0.0552	0.0329	0.1952	0.0881	0.2105	0.3053	0.4277															
716	0.0547	0.0326	0.1947	0.0873	0.2100	0.3052	0.4279															
717	0.0543	0.0323	0.1943	0.0865	0.2094	0.3052	0.4280															
718	0.0538	0.0319	0.1938	0.0857	0.2088	0.3050	0.4281															
719	0.0533	0.0316	0.1933	0.0849	0.2083	0.3050	0.4283															
720	0.0528	0.0313	0.1928	0.0841	0.2077	0.3049	0.4284															
721	0.0522	0.0309	0.1922	0.0831	0.2070	0.3048	0.4287															
722	0.0517	0.0305	0.1917	0.0822	0.2064	0.3047	0.4288															
723	0.0511	0.0301	0.1911	0.0812	0.2057	0.3046	0.4290															
724	0.0506	0.0298	0.1906	0.0804	0.2051	0.3045	0.4292															
725	0.0500	0.0294	0.1900	0.0794	0.2044	0.3044	0.4294															
726	0.0494	0.0291	0.1894	0.0785	0.2038	0.3044	0.4297															
727	0.0487	0.0287	0.1887	0.0774	0.2030	0.3043	0.4300															
728	0.0481	0.0283	0.1881	0.0763	0.2023	0.3042	0.4302															
729	0.0474	0.0279	0.1874	0.0753	0.2016	0.3042	0.4304															
730	0.0467	0.0275	0.1867	0.0742	0.2008	0.3041	0.4306															
731	0.0461	0.0271	0.1861	0.0732	0.2002	0.3041	0.4311															
732	0.0454	0.0267	0.1854	0.0721	0.1994	0.3040	0.4314															
733	0.0448	0.0264	0.1848	0.0712	0.1988	0.3040	0.4316															
734	0.0441	0.0260	0.1841	0.0701	0.1980	0.3039	0.4319															
735	0.0433	0.0255	0.1833	0.0688	0.1972	0.3039	0.4323															
736	0.0425	0.0251	0.1825	0.0676	0.1964	0.3038	0.4326															
737	0.0418	0.0247	0.1818	0.0665	0.1956	0.3039	0.4330															
738	0.0410	0.0243	0.1810	0.0653	0.1948	0.3038	0.4333															
739	0.0403	0.0239	0.1803	0.0642	0.1940	0.3037	0.4336															
740	0.0394	0.0234	0.1794	0.0628	0.1931	0.3037	0.4340															
741	0.0386	0.0230	0.1786	0.0617	0.1924	0.3037	0.4344															
742	0.0378	0.0226	0.1778	0.0604	0.1915	0.3037	0.4348															
743	0.0369	0.0221	0.1769	0.0590	0.1905	0.3037	0.4353															
744	0.0358	0.0215	0.1758	0.0573	0.1894	0.3037	0.4358															
745	0.0347	0.0210	0.1747	0.0556	0.1883	0.3037	0.4363															
746	0.0340	0.0207	0.1740	0.0547	0.1877	0.3037	0.4366															
747	0.0336	0.0204	0.1736	0.0540	0.1872	0.3037	0.4369															
748	0.0327	0.0200	0.1727	0.0526	0.1863	0.3036	0.4373															
749	0.0318	0.0196	0.1718	0.0514	0.1855	0.3036	0.4377															
750	0.0310	0.0191	0.1710	0.0501	0.1846	0.3036	0.4381															
751	0.0300	0.0186	0.1700	0.0486	0.1836	0.3036	0.4387															
752	0.0289	0.0181	0.1689	0.0470	0.1825	0.3036	0.4392															
753	0.0278	0.0175	0.1678	0.0454	0.1815	0.3036	0.4397															
754	0.0268	0.0170	0.1668	0.0439	0.1805	0.3036	0.4402															
755	0.0260	0.0166	0.1660	0.0427	0.1796	0.3036	0.4406															
756	0.0251	0.0162	0.1651	0.0413	0.1788	0.3036	0.4411															
757	0.0241	0.0157	0.1641	0.0396	0.1776	0.3036	0.4416															
758	0.0229	0.0151	0.1629	0.0380	0.1765	0.3037	0.4422															
759	0.0218	0.0145	0.1618	0.0363	0.1754	0.3036	0.4428															
760	0.0209	0.0141	0.1609	0.0350	0.1746	0.3037	0.4432															
761	0.0201	0.0137	0.1601	0.0338	0.1738	0.3037	0.4436															
762	0.0191	0.0132	0.1591	0.0323	0.1726	0.3037	0.4442															
763	0.0177	0.0125	0.1577	0.0303	0.1714	0.3037	0.4448															
764	0.0163	0.0118	0.1563	0.0281	0.1700	0.3037	0.4456															
765	0.0154	0.0114	0.1554	0.0268	0.1691	0.3037	0.4460															
766	0.0149	0.0112	0.1549	0.0261	0.1686	0.3037	0.4463															
767	0.0141	0.0108	0.1541	0.0249	0.1678	0.3038	0.4466															
768	0.0129	0.0103	0.1529	0.0231	0.1667	0.3038	0.4474															
769	0.0115	0.0098	0.1515	0.0211	0.1654	0.3038	0.4481															
770	0.0101	0.0089	0.1501	0.0190	0.1639	0.3039	0.4488															
771	0.0092	0.0085	0.1492	0.0178	0.1630	0.3039	0.4493															
772	0.0084	0.0081	0.1484	0.0166	0.1623	0.3039	0.4497															
773	0.0072	0.0076	0.1472	0.0148	0.1612	0.3040	0.4503															
774	0.0059	0.0069	0.1459	0.0129	0.1599	0.3040	0.4510															
775	0.0048	0.0063	0.1448	0.0109	0.1586	0.3040	0.4517															
776	0.0032	0.0056	0.1432	0.0089	0.1573	0.3040	0.4524															
777	0.0019	0.0050	0.1419	0.0069	0.1559	0.3040	0.4531															
778	0.0007	0.0044	0.1407	0.0051	0.1548	0.3041	0.4537															
779	-0.0003	0.0039	0.1397	0.0036	0.1537	0.3041	0.4543															
780	-0.0016	0.0033	0.1384	0.0018	0.1526	0.3041	0.4549															
781	-0.0028	0.0027	0.1372	-0.0001	0.1513	0.3041	0.4555															
782	-0.0041	0.0021	0.1359	-0.0020	0.1500	0.3041	0.4562															
783	-0.0054	0.0014	0.1346	-0.0040	0.1487	0.3041	0.4569															
784	-0.0069	0.0007	0.1331	-0.0062	0.1473	0.3041	0.4576															
785	-0.0083	0.0000	0.1317	-0.0083	0.1458	0.3041	0.4583															
786	-0.0099	-0.0008	0.1301	-0.0107	0.1443	0.3041	0.4591															
787	-0.0114	-0.0016	0.1286	-0.0130	0.1427	0.3041	0.4598															
788	-0.0128	-0.0024	0.1272	-0.0153	0.1412	0.3040	0.4604															
789	-0.0141	-0.0030	0.1259	-0.0171	0.1399	0.3040	0.4610															
790	-0.0152	-0.0037	0.1248	-0.0188	0.1388	0.3039	0.4615															
791	-0.0159	-0.0042	0.1241	-0.0201	0.1379	0.3038	0.4617															

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
792	-0.0156	-0.0043	0.1244	-0.0199	0.1379	0.3035	0.4613															
793	-0.0137	-0.0038	0.1263	-0.0174	0.1394	0.3031	0.4599															
794	-0.0099	-0.0024	0.1301	-0.0123	0.1427	0.3026	0.4575															
795	-0.0048	-0.0003	0.1352	-0.0051	0.1473	0.3021	0.4545															
796	0.0009	0.0021	0.1409	0.0029	0.1525	0.3016	0.4512															
797	0.0058	0.0043	0.1458	0.0100	0.1571	0.3014	0.4485															
798	0.0087	0.0057	0.1487	0.0145	0.1601	0.3014	0.4470															
799	0.0097	0.0064	0.1497	0.0161	0.1612	0.3015	0.4467															
800	0.0095	0.0065	0.1495	0.0161	0.1613	0.3018	0.4470															
801	0.0093	0.0066	0.1493	0.0158	0.1612	0.3019	0.4473															
802	0.0090	0.0067	0.1490	0.0157	0.1612	0.3022	0.4477															
803	0.0088	0.0067	0.1488	0.0155	0.1611	0.3023	0.4479															
804	0.0086	0.0067	0.1486	0.0154	0.1610	0.3024	0.4481															
805	0.0084	0.0067	0.1484	0.0151	0.1609	0.3025	0.4483															
806	0.0080	0.0067	0.1480	0.0147	0.1607	0.3027	0.4486															
807	0.0077	0.0066	0.1477	0.0143	0.1605	0.3028	0.4490															
808	0.0073	0.0066	0.1473	0.0139	0.1602	0.3029	0.4492															
809	0.0070	0.0065	0.1470	0.0135	0.1600	0.3030	0.4495															
810	0.0066	0.0064	0.1466	0.0130	0.1597	0.3031	0.4498															
811	0.0061	0.0063	0.1461	0.0124	0.1594	0.3033	0.4502															
812	0.0056	0.0062	0.1456	0.0118	0.1590	0.3034	0.4505															
813	0.0052	0.0061	0.1452	0.0112	0.1586	0.3035	0.4509															
814	0.0048	0.0060	0.1448	0.0106	0.1584	0.3036	0.4512															
815	0.0045	0.0059	0.1445	0.0104	0.1581	0.3037	0.4514															
816	0.0040	0.0058	0.1440	0.0098	0.1578	0.3037	0.4517															
817	0.0036	0.0057	0.1436	0.0092	0.1574	0.3039	0.4521															
818	0.0031	0.0055	0.1431	0.0087	0.1571	0.3039	0.4524															
819	0.0027	0.0054	0.1427	0.0081	0.1568	0.3040	0.4527															
820	0.0024	0.0053	0.1424	0.0077	0.1565	0.3041	0.4529															
821	0.0019	0.0052	0.1419	0.0070	0.1561	0.3042	0.4533															
822	0.0014	0.0050	0.1414	0.0064	0.1557	0.3043	0.4536															
823	0.0009	0.0049	0.1409	0.0058	0.1553	0.3044	0.4540															
824	0.0005	0.0048	0.1405	0.0052	0.1550	0.3045	0.4543															
825	0.0001	0.0046	0.1401	0.0047	0.1547	0.3046	0.4546															
826	-0.0003	0.0045	0.1397	0.0042	0.1543	0.3047	0.4548															
827	-0.0007	0.0044	0.1393	0.0036	0.1540	0.3047	0.4551															
828	-0.0013	0.0042	0.1387	0.0029	0.1536	0.3048	0.4554															
829	-0.0017	0.0040	0.1383	0.0023	0.1532	0.3049	0.4558															
830	-0.0021	0.0039	0.1379	0.0018	0.1528	0.3050	0.4560															
831	-0.0025	0.0038	0.1375	0.0013	0.1525	0.3050	0.4563															
832	-0.0030	0.0036	0.1370	0.0006	0.1521	0.3051	0.4567															
833	-0.0036	0.0034	0.1364	-0.0001	0.1516	0.3052	0.4570															
834	-0.0041	0.0033	0.1359	-0.0008	0.1513	0.3054	0.4574															
835	-0.0045	0.0032	0.1355	-0.0014	0.1509	0.3054	0.4577															
836	-0.0049	0.0030	0.1351	-0.0019	0.1506	0.3055	0.4579															
837	-0.0053	0.0029	0.1347	-0.0024	0.1502	0.3055	0.4582															
838	-0.0058	0.0027	0.1342	-0.0030	0.1498	0.3056	0.4585															
839	-0.0063	0.0025	0.1337	-0.0037	0.1494	0.3057	0.4588															
840	-0.0067	0.0024	0.1333	-0.0043	0.1490	0.3057	0.4590															
841	-0.0070	0.0022	0.1330	-0.0048	0.1487	0.3057	0.4592															
842	-0.0074	0.0020	0.1326	-0.0054	0.1483	0.3058	0.4595															
843	-0.0080	0.0019	0.1320	-0.0061	0.1479	0.3059	0.4599															
844	-0.0086	0.0017	0.1314	-0.0069	0.1474	0.3060	0.4604															
845	-0.0093	0.0015	0.1307	-0.0077	0.1469	0.3062	0.4608															
846	-0.0098	0.0014	0.1302	-0.0084	0.1465	0.3063	0.4612															
847	-0.0103	0.0012	0.1297	-0.0090	0.1461	0.3064	0.4615															
848	-0.0106	0.0011	0.1294	-0.0095	0.1458	0.3064	0.4617															
849	-0.0109	0.0009	0.1291	-0.0100	0.1454	0.3064	0.4618															
850	-0.0112	0.0007	0.1288	-0.0105	0.1451	0.3064	0.4620															
851	-0.0117	0.0006	0.1283	-0.0111	0.1448	0.3064	0.4623															
852	-0.0121	0.0005	0.1279	-0.0118	0.1444	0.3065	0.4625															
853	-0.0125	0.0003	0.1275	-0.0122	0.1441	0.3066	0.4628															
854	-0.0130	0.0002	0.1270	-0.0128	0.1437	0.3067	0.4632															
855	-0.0135	0.0000	0.1265	-0.0134	0.1433	0.3068	0.4635															
856	-0.0140	-0.0001	0.1260	-0.0141	0.1429	0.3069	0.4639															
857	-0.0145	-0.0003	0.1255	-0.0148	0.1425	0.3070	0.4643															
858	-0.0150	-0.0005	0.1250	-0.0154	0.1421	0.3070	0.4645															
859	-0.0152	-0.0006	0.1248	-0.0158	0.1418	0.3070	0.4646															
860	-0.0156	-0.0008	0.1244	-0.0163	0.1415	0.3070	0.4648															
861	-0.0160	-0.0009	0.1240	-0.0169	0.1411	0.3071	0.4651															
862	-0.0164	-0.0010	0.1236	-0.0174	0.1408	0.3072	0.4654															
863	-0.0168	-0.0012	0.1232	-0.0180	0.1404	0.3072	0.4656															
864	-0.0172	-0.0014	0.1228	-0.0186	0.1400	0.3073	0.4659															
865	-0.0177	-0.0015	0.1223	-0.0192	0.1396	0.3073	0.4662															
866	-0.0182	-0.0017	0.1218	-0.0199	0.1392	0.3074	0.4665															
867	-0.0186	-0.0019	0.1214	-0.0205	0.1388	0.3074	0.4667															
868	-0.0190	-0.0021	0.1210	-0.0210	0.1385	0.3074	0.4669															
869	-0.0193	-0.0022	0.1207	-0.0216	0.1381	0.3075	0.4671															
870	-0.0198	-0.0023	0.1202	-0.0221	0.1378	0.3075	0.4674															
871	-0.0201	-0.0025	0.1199	-0.0226	0.1374	0.3076	0.4676															
872	-0.0205	-0.0026	0.1195	-0.0232	0.1371	0.3076	0.4679															
873	-0.0209	-0.0028	0.1191	-0.0237	0.1367	0.3077	0.4681															
874	-0.0213	-0.0030	0.1187	-0.0243	0.1364	0.3077	0.4684															
875	-0.0217	-0.0031	0.1183	-0.0248	0.1360	0.3078	0.4686															
876	-0.0221	-0.0032	0.1179	-0.0254	0.1357	0.3078	0.4689															
877	-0.0225	-0.0034	0.1175	-0.0259	0.1354	0.3079	0.4691															
878	-0.0229	-0.0035	0.1171	-0.0264	0.1351	0.3079	0.4693															
879	-0.0232	-0.0037	0.1168	-0.0269	0.1347	0.3080	0.4696															
880	-0.0236	-0.0038	0.1164	-0.0275	0.1344	0.3080	0.4698															
881	-0.0240	-0.0040	0.1160	-0.0280	0.1340	0.3080	0.4700															
882	-0.0243	-0.0041	0.1157	-0.0284	0.1338	0.3081	0.4703															
883	-0.0247	-0.0042	0.1153	-0.0288	0.1335	0.3082	0.4705															
884	-0.0251	-0.0043	0.1149	-0.0294	0.1331	0.3082	0.4707															
885	-0.0254	-0.0045	0.1146	-0.0299	0.1328	0.3082	0.4709															
886	-0.0258	-0.0046	0.1142	-0.0305	0.1324	0.3083	0.4712															
887	-0.0262	-0.0048	0.1138	-0.0310	0.1321	0.3083	0.4714															
888	-0.0266	-0.0049	0.1134	-0.0315	0.1318	0.3083	0.4716															
889	-0.0270	-0.0051	0.1130	-0.0321	0.1314	0.3084	0.4718															
890	-0.0273	-0.0053	0.1127	-0.0326	0.1311	0.3084	0.4721															
891	-0.0277	-0.0054	0.1123	-0.0331	0.1308	0.3085	0.4724															
892	-0.0281	-0.0056	0.1119	-0.0336	0.1304	0.3086	0.4726															
893	-0.0285	-0.0057	0.1115	-0.0342	0.1301	0.3086	0.4728															
894	-0.0289	-0.0059	0.1111	-0.0348	0.1297	0.3086	0.4730															
895	-0.0293	-0.0060	0.1107	-0.0353	0.1293	0.3086	0.4733															
896	-0.0297	-0.0062	0.1103	-0.0359	0.1290	0.3087	0.4735															
897	-0.0301	-0.0063	0.1099	-0.0364	0.1286	0.3087	0.4738															
898	-0.0305	-0.0065	0.1095	-0.0370	0.1283	0.3088	0.4741															
899	-0.0310	-0.0067	0.1090	-0.0378	0.1279	0.3088	0.4743															
900	-0.0315	-0.0069	0.1085	-0.0384	0.1274	0.3088	0.4746															
901	-0.0320	-0.0071	0.1080	-0.0391	0.1269	0.3089	0.4749															
902	-0.0325	-0.0073	0.1075	-0.0398	0.1264	0.3089	0.4752															
903	-0.0331	-0.0076	0.1069	-0.0407	0.1258	0.3089	0.4755															
904	-0.0337	-0.0079	0.1063	-0.0416	0.1252	0.3089	0.4756															

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
905	-0.0343	-0.0061	0.1057	-0.0424	0.1247	0.3090	0.4762															
906	-0.0348	-0.0063	0.1052	-0.0431	0.1243	0.3091	0.4766															
907	-0.0356	-0.0065	0.1045	-0.0440	0.1237	0.3092	0.4769															
908	-0.0362	-0.0069	0.1038	-0.0452	0.1230	0.3092	0.4773															
909	-0.0372	-0.0094	0.1028	-0.0468	0.1220	0.3092	0.4778															
910	-0.0382	-0.0099	0.1018	-0.0481	0.1210	0.3092	0.4783															
911	-0.0393	-0.0103	0.1007	-0.0497	0.1200	0.3093	0.4790															
912	-0.0405	-0.0107	0.0995	-0.0512	0.1190	0.3095	0.4796															
913	-0.0419	-0.0114	0.0981	-0.0533	0.1177	0.3096	0.4805															
914	-0.0436	-0.0122	0.0964	-0.0558	0.1160	0.3097	0.4815															
915	-0.0454	-0.0129	0.0948	-0.0583	0.1144	0.3098	0.4825															
916	-0.0470	-0.0136	0.0930	-0.0606	0.1129	0.3099	0.4834															
917	-0.0477	-0.0139	0.0923	-0.0615	0.1123	0.3100	0.4838															
918	-0.0467	-0.0134	0.0933	-0.0600	0.1133	0.3099	0.4833															
919	-0.0443	-0.0125	0.0957	-0.0568	0.1153	0.3098	0.4818															
920	-0.0424	-0.0119	0.0976	-0.0544	0.1169	0.3093	0.4805															
921	-0.0413	-0.0112	0.0987	-0.0525	0.1182	0.3094	0.4800															
922	-0.0402	-0.0106	0.0998	-0.0508	0.1193	0.3095	0.4797															
923	-0.0394	-0.0104	0.1006	-0.0498	0.1199	0.3093	0.4791															
924	-0.0389	-0.0103	0.1011	-0.0492	0.1203	0.3091	0.4786															
925	-0.0383	-0.0101	0.1017	-0.0484	0.1207	0.3090	0.4782															
926	-0.0378	-0.0099	0.1022	-0.0478	0.1211	0.3090	0.4779															
927	-0.0372	-0.0097	0.1028	-0.0469	0.1217	0.3089	0.4775															
928	-0.0367	-0.0094	0.1033	-0.0461	0.1222	0.3090	0.4774															
929	-0.0363	-0.0091	0.1037	-0.0454	0.1227	0.3090	0.4771															
930	-0.0356	-0.0087	0.1044	-0.0443	0.1235	0.3090	0.4768															
931	-0.0349	-0.0084	0.1051	-0.0433	0.1242	0.3091	0.4766															
932	-0.0345	-0.0082	0.1055	-0.0427	0.1245	0.3091	0.4763															
933	-0.0339	-0.0078	0.1061	-0.0417	0.1253	0.3091	0.4761															
934	-0.0333	-0.0077	0.1067	-0.0410	0.1256	0.3089	0.4756															
935	-0.0337	-0.0088	0.1063	-0.0424	0.1245	0.3082	0.4751															
936	-0.0334	-0.0079	0.1066	-0.0413	0.1254	0.3088	0.4755															
937	-0.0326	-0.0066	0.1074	-0.0394	0.1269	0.3095	0.4758															
938	-0.0321	-0.0063	0.1079	-0.0384	0.1277	0.3097	0.4758															
939	-0.0319	-0.0064	0.1081	-0.0383	0.1278	0.3095	0.4755															
940	-0.0315	-0.0062	0.1085	-0.0377	0.1281	0.3096	0.4754															
941	-0.0311	-0.0059	0.1089	-0.0369	0.1286	0.3097	0.4752															
942	-0.0306	-0.0057	0.1094	-0.0364	0.1290	0.3096	0.4749															
943	-0.0303	-0.0058	0.1097	-0.0361	0.1291	0.3094	0.4745															
944	-0.0299	-0.0057	0.1101	-0.0356	0.1293	0.3093	0.4742															
945	-0.0298	-0.0056	0.1102	-0.0353	0.1295	0.3093	0.4742															
946	-0.0296	-0.0055	0.1104	-0.0351	0.1297	0.3093	0.4741															
947	-0.0292	-0.0053	0.1108	-0.0345	0.1301	0.3093	0.4739															
948	-0.0295	-0.0061	0.1105	-0.0358	0.1291	0.3087	0.4734															
949	-0.0298	-0.0061	0.1102	-0.0358	0.1290	0.3088	0.4737															
950	-0.0293	-0.0051	0.1107	-0.0343	0.1303	0.3096	0.4742															
951	-0.0288	-0.0044	0.1112	-0.0332	0.1312	0.3100	0.4743															
952	-0.0288	-0.0048	0.1112	-0.0336	0.1308	0.3096	0.4740															
953	-0.0287	-0.0049	0.1113	-0.0337	0.1307	0.3094	0.4738															
954	-0.0285	-0.0047	0.1115	-0.0332	0.1310	0.3096	0.4739															
955	-0.0282	-0.0045	0.1118	-0.0327	0.1314	0.3096	0.4737															
956	-0.0283	-0.0047	0.1117	-0.0330	0.1311	0.3094	0.4736															
957	-0.0282	-0.0048	0.1118	-0.0328	0.1313	0.3095	0.4736															
958	-0.0277	-0.0038	0.1123	-0.0315	0.1324	0.3101	0.4740															
959	-0.0274	-0.0035	0.1126	-0.0308	0.1329	0.3102	0.4739															
960	-0.0278	-0.0042	0.1124	-0.0318	0.1320	0.3098	0.4734															
961	-0.0278	-0.0042	0.1124	-0.0318	0.1320	0.3095	0.4733															
962	-0.0274	-0.0041	0.1126	-0.0314	0.1323	0.3098	0.4733															
963	-0.0272	-0.0039	0.1128	-0.0311	0.1325	0.3097	0.4734															
964	-0.0271	-0.0037	0.1129	-0.0306	0.1328	0.3098	0.4734															
965	-0.0269	-0.0034	0.1131	-0.0302	0.1332	0.3101	0.4735															
966	-0.0267	-0.0034	0.1133	-0.0300	0.1333	0.3100	0.4733															
967	-0.0267	-0.0037	0.1133	-0.0304	0.1330	0.3097	0.4731															
968	-0.0267	-0.0040	0.1133	-0.0307	0.1326	0.3094	0.4728															
969	-0.0267	-0.0038	0.1133	-0.0305	0.1329	0.3096	0.4729															
970	-0.0264	-0.0032	0.1136	-0.0295	0.1337	0.3100	0.4732															
971	-0.0262	-0.0031	0.1138	-0.0294	0.1337	0.3100	0.4731															
972	-0.0262	-0.0031	0.1138	-0.0294	0.1337	0.3100	0.4731															
973	-0.0259	-0.0026	0.1141	-0.0284	0.1345	0.3104	0.4733															
974	-0.0257	-0.0023	0.1143	-0.0280	0.1348	0.3105	0.4734															
975	-0.0259	-0.0029	0.1141	-0.0288	0.1342	0.3101	0.4731															
976	-0.0259	-0.0027	0.1141	-0.0286	0.1343	0.3102	0.4731															
977	-0.0256	-0.0024	0.1144	-0.0281	0.1348	0.3104	0.4732															
978	-0.0257	-0.0024	0.1143	-0.0281	0.1347	0.3104	0.4732															
979	-0.0256	-0.0025	0.1144	-0.0282	0.1346	0.3103	0.4731															
980	-0.0257	-0.0026	0.1143	-0.0282	0.1346	0.3102	0.4731															
981	-0.0258	-0.0026	0.1142	-0.0284	0.1345	0.3103	0.4732															
982	-0.0256	-0.0026	0.1144	-0.0282	0.1346	0.3102	0.4730															
983	-0.0257	-0.0026	0.1143	-0.0283	0.1345	0.3102	0.4731															
984	-0.0257	-0.0025	0.1143	-0.0282	0.1347	0.3103	0.4731															
985	-0.0257	-0.0024	0.1143	-0.0281	0.1348	0.3104	0.4733															
986	-0.0257	-0.0027	0.1143	-0.0284	0.1345	0.3102	0.4730															
987	-0.0256	-0.0026	0.1144	-0.0283	0.1346	0.3102	0.4730															
988	-0.0256	-0.0028	0.1144	-0.0284	0.1344	0.3100	0.4728															
989	-0.0257	-0.0026	0.1143	-0.0283	0.1346	0.3102	0.4730															
990	-0.0255	-0.0027	0.1146	-0.0282	0.1346	0.3101	0.4728															
991	-0.0258	-0.0026	0.1142	-0.0284	0.1345	0.3102	0.4731															
992	-0.0257	-0.0027	0.1143	-0.0284	0.1345	0.3102	0.4730															
993	-0.0257	-0.0027	0.1143	-0.0284	0.1344	0.3102	0.4730															
994	-0.0257	-0.0024	0.1143	-0.0281	0.1348	0.3104	0.4733															
995	-0.0261	-0.0027	0.1139	-0.0288	0.1342	0.3103	0.4734															
996	-0.0254	-0.0027	0.1146	-0.0281	0.1346	0.3100	0.4727															
997	-0.0256	-0.0024	0.1144	-0.0280	0.1348	0.3104	0.4732															
998	-0.0257	-0.0027	0.1143	-0.0284	0.1344	0.3102	0.4731															
999	-0.0259	-0.0026	0.1141	-0.0284	0.1345	0.3104	0.4733															
1000	-0.0258	-0.0024	0.1142	-0.0282	0.1347	0.3106	0.4735															
1001	-0.0255	-0.0025	0.1145	-0.0280	0.1347	0.3103	0.4730															